YÖS

YABANCI ÖĞRENCİ SINAVLARI
FOREIGN STUDENT EXAMINATIONS

MATEMATİK 1
MATHEMATICS 1

SORU BANKASI
QUESTION BANK

1392 Alıştırma Sorusu
Exercise Questions

2885 Test Sorusu
Test Questions

208 YÖS Sorusu
YÖS Questions

Türkiye'de ve Dünyada!
In Turkey and Around the World!

METROPOL YAYINLARI
5. Baskı - 5th Edition

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ÖNSÖZ

Değerli öğrenciler,

Metropol Eğitim Kurumları, 1995'den bugüne üniversite giriş sınavlarına hazırlanan öğrencilere kurs, yayın ve rehberlik hizmetleri sunan, Türkiye'de ve Dünyanın farklı ülkelerinde şube ve temsilcilikleri bulunan uluslararası bir eğitim kurumları zinciridir.

Kurumlarımız, Türkiye üniversitelerinin gerçekleştirdikleri Yurtdışından Öğrenci Kabul Sınavları ya da bilinen adıyla Yabancı Uyruklu Öğrenci Sınavlarına (YÖS) hazırlanan ve bu üniversitelerde yüksek öğrenim görmeyi hedefleyen yabancı uyruklu ve T.C. vatandaşı öğrencilere kurs, yayın ve danışmalık hizmetleri vermektedirler.

Türkiye'nin önde gelen üniversitelerinin düzenledikleri bu sınavlarda (YÖS), Temel Öğrenme Becerileri Testi ve Türkçe Yeterlilik Testi olmak üzere iki ayrı test yer almaktadır. Sınavlardaki Türkçe testleri, sınava katılan öğrencilerin Türkçe dil yeterliliklerini ölçmek için uygulanmakta olup, yerleştirme puanlarını etkilememektedir. Temel Öğrenme Becerileri Testleri ise sınavların değerlendirmelerinde ve üniversitelere kabul aşamalarında dikkate alınmakta ve yerleştirmeler bu testlerin sonuçlarına göre yapılmaktadır.

Bu nedenle, sınavlarda başarılı olabilmek için öncelikle Temel Öğrenme Becerileri Testlerinde baraj olarak belirlenen puanları aşmanız ve hedeflediğiniz puanlara ulaşmanız gerekmektedir.

Sınavlardaki Temel Öğrenme Becerileri Testlerinde Genel Yetenek (IQ), Matematik ve Geometri soruları yer almakta olup; bu testlerin ortalama olarak % 40'ının Matematik sorularından oluştuğu dikkate alındığında, bu soruları doğru yanıtlamanız sınavların başarı sıralamalarında öne çıkmanızı sağlayacaktır.

Türkiye'nin seçkin üniversitelerinde öğrenim görebilme şansını yakalayabilmek için YÖS hazırlık kurslarımıza katılmanızı ve yayınlarımızı hazırlamış olan, alanında uzman ve deneyimli öğretmenlerimizden destek almanızı öneririz.

Tüm YÖS adaylarına başarılar dileriz!

PREFACE

Dear students,

Metropol Educational Institutions are a group of international educational institutions since 1995 which have been offering services such as training, publications and consultancy to students who are studying for the university entrance exam and which have branches and representations in Turkey and different countries in the world.

Our Institutions provide courses, publications and consultancy services to foreign and Turkish students who are preparing for the Foreign Students Acceptance Exams alias Foreign Students Exams (YÖS) which are held by the universities in Turkey.

In these exams (YÖS) held by the renowned universities in Turkey, there are two separate tests; Basic Learning Skills Test and Turkish Language Test. The Turkish Language Tests applied in the exams are intended to measure the Turkish language skills of the students who enter the exam and it does not effect on the placement score. The Basic Learning Skills Test is taken into consideration in the evaluation processes of the exams and in the acceptance processes by the universities; the placements are performed according to the results of these tests.

Therefore, in order to be successful in the exams, first of all you need to get higher scores than the base point determined for the Basic Learning Skills Test and reach the scores that you have targeted.

The Basic Learning Skills Tests include Intelligent Quotient (IQ), Mathematics and Geometry questions; considering that Mathematics comprises of the 40% of the questions averagely, giving the correct answers to these questions enables you to come to the forefront in the success ratings of these tests.

We suggest that you participate in YÖS preparation courses and obtain support from expert and experienced teachers who prepare the publications in order to have the chance to receive education in the respected universities of Turkey.

We wish luck to all YÖS candidates!

METROPOL EĞİTİM KURUMLARI
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VORWORT

Liebe Schülerinnen und Schüler,

Die Metropol Bildungsinstitution ist eine internationale Kette, die seit 1995 mit Diensleistungen wie Schulungen, Publikationen und Beratungen Schüler/ -innen auf die Studienberechtigungsprüfung vorbereitet und sowohl in der Türkei als auch in verschiedenen Ländern der Welt Niederlassungen und Vertretungen besitzt.

Unsere İnstitutionen unterstützen Schüler/ -innen türkischer und ausländischer Staatsbürgerschaft, die sich auf die Prüfungen zur Aufnahme von ausländischen Schülern/ -innen alias Prüfung für auslandsstämmige Schüler/ -innen (YÖS), die von den Universitäten in der Türkei veranstaltet werden, vorbereiten und an diesen Universitäten studieren möchten.

Die von renommierten Universitäten angebotene Prüfung (YÖS) ist in zwei Bereichen erfolgreich zu bestehen. Der erste Teil betrifft die Fähigkeit Grundlagenkenntnisse zu erwerben, wobei der zweite Teil die Sprachkenntnisse im Türkischen prüft.

Mit Hilfe dieser Eignungstests werden die türkischen Sprachkenntnisse der Schüler/ -innen ermittelt, dabei haben sie keinen Einfluss auf die Platzierungspunkte. Ausschlaggebend für die Platzierung der Bewerber/innen an den Universitäten ist der Grundlernfähigkeitstest, bei dem die allgemeine Mindestpunktzahl der Prüfung und die erforderliche Punktzahl des erstrebten Studienfachs zu erreichen ist.

Dieser Test beinhaltet Fragen zur allgemeinen Fähigkeit (IQ), Mathematik und Geometrie. In Anbetracht der Tatsache, dass der Mathematik 40% der Prüfung darstellt, ist es für Sie von Vorteil den Fokus auf diesen Bereich zu legen, um unter die Besten zu kommen.

Um an den renommierten Hoschulen der Türkei studieren zu können, empfehlen wir Ihnen, an unseren YÖS-Vorbereitungskursen teilzunehmen und sich von unseren kompetenten und erfahrenen Lehrkräften , die die Publikationen vorbereitet haben, untersützen zu lassen.

Wir wünschen allen YÖS Kandidaten viel Erfolg!

ВСТУПЛЕНИЕ

Уважаемые студенты!

Образовательные учреждения Metropol – это международная сеть учебных заведений, которая с 1995 года по сегодняшний день предоставляет для студентов, готовящихся к вступительным экзаменам в университет, поддержку в виде курсов, публикаций и консультаций. Образовательные учреждения Metropol имеют филиалы и представительства в Турции и в разных странах мира.

Наши учреждения оказывают поддержку иностранным и турецким студентам, которые нацелены получить высшее образование в университетах Турции и готовятся к сдаче вступительных экзаменов для иностранных студентов, известных как экзамены для иностранных студентов YÖS, проводящихся данными университетами.

Экзамены YÖS организуются ведущими университетами Турции и состоят из двух отдельных частей: теста "Основные навыки обучения" и экзамена на знание турецкого языка. Тест на знание турецкого языка включен в экзамен для определения уровня владения турецким языком студентов, сдающих экзамен, и на распределение результатов не влияет. Распределение осуществляется на основании результатов теста "Основные навыки обучения", который принимается во внимание при оценке экзамена и на этапе приёма в университет.

Поэтому, для того, чтобы успешно сдать экзамены, прежде всего, Вы должны получить более высокий балл, чем граничный балл, определенный для теста "Основные навыки обучения", и достичь запланированной оценки.

Экзаменационный тест "Основные навыки обучения" содержит вопросы на уровень интеллекта (IQ), вопросы по математике и геометрии. Учитывая, что 40% вопросов теста составляют вопросы на уровень интеллекта (IQ), правильно

Для того, чтобы иметь возможность получить образование в элитных вузах Турции, мы предлагаем вам принять участие в подготовительных курсах YÖS и получить поддержку наших опытных преподавателей, которые являются специалистами в своей области и готовят наши публикации.

Мы желаем успехов всем кандидатам, готовящимся к экзамену **YÖS**!

METROPOL BILDUNGSINSTITUTIONEN

ОБРАЗОВАТЕЛЬНЫЕ УЧРЕЖДЕНИЯ METROPOL

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BÖLÜM CHAPTER 1

TARİHSEL NOT / HISTORICAL NOTE

Johann Heinrich Lambert [1728 – 1777]

Johann Lambert, ilk defa π nin bir irrasyonel sayı olduğunu kesin olarak ispatlayan ünlü Fransız matematikçisidir.

Johann Lambert famous french mathematician, was the first to provide a rigorous proof that π is irrational.

SAYILAR / NUMBERS

Bu bölüm 176 alıştırma sorusu, 352 test sorusu, 16 YÖS sorusu içermektedir.

This chapter includes 174 exercise questions, 352 test questions and 16 YÖS questions.

BÖLÜM / CHAPTER 1

SAYILAR / NUMBERS

- Sayılar / Numbers . . . 1 - 70

BÖLÜM 01 CHAPTER

SAYILAR
NUMBERS

Alıştırmalar / Exercises

Sayılar / Numbers

1. $\left.\begin{array}{l} A+2B=3 \\ 2A+B=9 \end{array}\right\} \Rightarrow$ **A + B = ?**

Yanıt / The Answer is 4

2. a, b, c birer rakam olmak üzere

$a \neq b \neq c \neq 0$

$\Rightarrow$ **min(2a + 3b – 4c) = ?**

Yanıt / The Answer is –29

3. a, b, c birer rakam olmak üzere

$a \neq b \neq c$

$3a + 2b + 4c = 39 \Rightarrow$ **max(a) = ?**

Yanıt / The Answer is 9

4. $a, b \in Z^+$,

$a + b = 8 \Rightarrow$ **max(a·b) = ?**

Yanıt / The Answer is 16

5. $A, B \in N^+$,

$A + B = 12 \Rightarrow$ **max(A·B) + min(A·B) = ?**

Yanıt / The Answer is 47

6. $a + b = 7 \Rightarrow$ **max(a·b) = ?**

Yanıt / The Answer is $\frac{49}{4}$

7. $x, y, z \in Z^+$,

$x + y + z = 24 \Rightarrow$ **max (x·y·z) = ?**

Yanıt / The Answer is 512

8. $a, b \in N^+$,

$a \cdot b = 15 \Rightarrow$ **max(a + b) = ?**

Yanıt / The Answer is 16

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9. $a, b \in N^+$

$a \cdot b = 63 \Rightarrow$ **$\min(a + b) = ?$**

Yanıt / The Answer is 16

10. $a, b \in N^+$

$a \cdot b = 45$

$\Rightarrow$ **$\max(a + b) + \min(a + b) = ?$**

Yanıt / The Answer is 60

11. **$(-4) \cdot [4 : 2 + 3] = ?$**

Yanıt / The Answer is –20

12. **$(3 - 5) \cdot [12 : 3 - 3] = ?$**

Yanıt / The Answer is –2

13. **$-[-(6 - 2 \cdot 4)] = ?$**

Yanıt / The Answer is –2

14. **$12 : 6 \cdot (-2) = ?$**

Yanıt / The Answer is –4

15. **$(-4 : 2) \cdot 9 - 5 = ?$**

Yanıt / The Answer is –23

16. **$12 \cdot 14 - 8 \cdot 23 = ?$**

Yanıt / The Answer is –16

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17. $-[-(4-2+3)\cdot 2] = ?$

Yanıt / The Answer is 10

18. $[((-39) : 13)\cdot(-3)] - 7 : 7 = ?$

Yanıt / The Answer is 8

19. $[(25) : (-5) - 3] : 4 - 5 = ?$

Yanıt / The Answer is –7

20. $\dfrac{18 : (-3) + (-2)\cdot(4)}{7} = ?$

Yanıt / The Answer is –2

21. $5 - [6 - (4 - 3)]\cdot 2 = ?$

Yanıt / The Answer is –5

22. $[(144 : 6)\cdot 2 - (36 - 4\cdot 3)] = ?$

Yanıt / The Answer is 24

23. $[-(4 - 12) : 2 + 3\cdot 5] = ?$

Yanıt / The Answer is 19

24. $[6 : (-3)] + [64 : (-8)] + 10 = ?$

Yanıt / The Answer is 0

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25. $\left(\frac{40}{4}\cdot\frac{22}{11}-\frac{72}{9}\cdot\frac{70}{7}\right)\cdot\left(\frac{-10}{5}\right)-8=?$

Yanıt / The Answer is 112

26. $\frac{45}{9}\cdot\frac{36}{6}-\frac{27}{9}\cdot\frac{42}{7}-(-12)=?$

Yanıt / The Answer is 24

27. $\frac{56}{-8}\cdot\left(\frac{-10}{2}+\frac{12}{3}\cdot\frac{8}{-2}\right)+5=?$

Yanıt / The Answer is 152

28. $-\left[-\left(\frac{14}{-7}-\frac{-56}{8}\right)-9\right]+15=?$

Yanıt / The Answer is 29

29. $\left[3-\left(\frac{35}{7}\cdot\frac{18}{3}-\frac{18}{9}\cdot\frac{42}{6}\right)\right]\cdot2-17=?$

Yanıt / The Answer is –43

30. $\left[14-2\cdot\left(\frac{48}{6}\cdot\frac{12}{3}-\frac{25}{5}\cdot\frac{28}{7}\right)\right]-6\cdot3=?$

Yanıt / The Answer is –28

31. $\left[20+3\cdot\left(\frac{-20}{4}\cdot\frac{15}{-3}-\frac{35}{7}\right)\right]=?$

Yanıt / The Answer is 80

32. $-\left[-\frac{11-2}{3}-\frac{47-21}{13}+13\right]+23=?$

Yanıt / The Answer is 15

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33. $AB, BA \in N$

$AB + BA = 55 \Rightarrow$ **$A + B = ?$**

Yanıt / The Answer is 5

---

34. $AB, BA \in N$

$AB + BA = 4(A + B) + 63 \Rightarrow$ **$A + B = ?$**

Yanıt / The Answer is 9

---

35. $AB, BA \in N$

$AB - BA = 72 \Rightarrow$ **$A - B = ?$**

Yanıt / The Answer is 8

---

36. $AB, BC, CA \in N$

$\Rightarrow \dfrac{AB + BC + CA}{A + B + C} = ?$

Yanıt / The Answer is 11

---

37. $AB, BA \in N$

$AB - BA = 63$

$A + B = 9 \Rightarrow$ **$\dfrac{A}{B} = ?$**

Yanıt / The Answer is 8

---

38. $AB \in N$

$AB = 6\cdot(A + B) \Rightarrow$ **$A\cdot B = ?$**

Yanıt / The Answer is 20

---

39. $ABC, CBA \in N, \; A \neq B \neq C$

$ABC - CBA = 495$

$\Rightarrow$ **$\max(ABC) = ?$**

Yanıt / The Answer is 984

---

40. $ABC, CBA \in N, \; A \neq B \neq C$

$ABC - CBA = 693$

$\Rightarrow$ **$\min(ABC) = ?$**

Yanıt / The Answer is 801

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41. AB, BA $\in$ N

AB + 1 = 3·(BA) $\Rightarrow$ **A – B = ?**

Yanıt / The Answer is 3

42. AB, BA $\in$ N

2·(AB) = BA + 30 $\Rightarrow$ **A + B = ?**

Yanıt / The Answer is 3

43. XX $\in$ N

X·(XX) = 176 $\Rightarrow$ **X = ?**

Yanıt / The Answer is 4

44. AB, BA, AA $\in$ N

$\frac{AB + BA}{AA} = 5 \Rightarrow \sum AB = ?$

Yanıt / The Answer is 123

45. $(1011)_2 = (x)_{10} \Rightarrow$ **x = ?**

Yanıt / The Answer is 11

46. $(123)_4 = (x)_{10} \Rightarrow$ **x = ?**

Yanıt / The Answer is 27

47. $(1023)_5 = (x)_{10} \Rightarrow$ **x = ?**

Yanıt / The Answer is 138

48. $(11)_5 = (A)_{10} \Rightarrow$ **A^2 = ?**

Yanıt / The Answer is 36

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49. $(102)_5 = (12a)_4 \Rightarrow$ **a = ?**

Yanıt / The Answer is 3

50. $(1203)_4 = (3a4)_5 \Rightarrow$ **a = ?**

Yanıt / The Answer is 4

51. $(1a14)_5 = (a53)_7 \Rightarrow$ **a = ?**

Yanıt / The Answer is 4

52. $(xy)_5 = (yx)_7 \Rightarrow$ **x + y = ?**

Yanıt / The Answer is 5

53. $(21{,}03)_4 = (A)_{10} \Rightarrow$ **A = ?**

Yanıt / The Answer is $\frac{147}{16}$

54. $(12{,}22)_5 = (x)_{10} \Rightarrow$ **x = ?**

Yanıt / The Answer is 7,48

55. $\left.\begin{array}{l}(xyz)_a = 15\\(xyzxyz)_a = 420\end{array}\right\} \Rightarrow$ **a^2 = ?**

Yanıt / The Answer is 9

56. $(111)_{10} = (x)_5 \Rightarrow$ **x = ?**

Yanıt / The Answer is 421

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57. $(97)_{10} = (A)_6 \Rightarrow$ **A = ?**

Yanıt / The Answer is 241

58. $(38)_{10} = (A)_2 \Rightarrow$ **A = ?**

Yanıt / The Answer is 100110

59. $(12)_3 \cdot (23)_4 = (x)_5 \Rightarrow$ **x = ?**

Yanıt / The Answer is 210

60. $x > 2$,

$(121)_x = A \Rightarrow (A)_{x+1} = ?$

Yanıt / The Answer is 100

61. $(2a1)_4 - (12a)_4 = (30)_5 \Rightarrow$ **a = ?**

Yanıt / The Answer is 2

62. $(102)_3 + (201)_3 = ?$

Yanıt / The Answer is 1010

63. $(xy)_5 + (yx)_5 = (143)_5 \Rightarrow$ **x + y = ?**

Yanıt / The Answer is 8

64. $(221)_5 + (234)_5 = (A)_5 \Rightarrow$ **x + y = ?**

Yanıt / The Answer is 1010

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65. $(xy)_3 - (yx)_3 = x \Rightarrow$ **x + y = ?**

Yanıt / The Answer is 3

66. $(234)_5 \cdot (23)_5 = (x)_5 \Rightarrow$ **x = ?**

Yanıt / The Answer is 12042

67. $\left.\begin{array}{l} x - y = (21)_4 \\ x + y = (121)_4 \end{array}\right\} \Rightarrow (x)_4 = ?$

Yanıt / The Answer is 101

68. $(2,14)_5 + (12,41)_5 - (1,24)_5 = (x)_5 \Rightarrow$ **x = ?**

Yanıt / The Answer is 13,31

69. A, B ∈ N

$$\begin{array}{r} A \\ -\ B \\ \hline 12 \end{array} \qquad \begin{array}{r} B \\ -\ C \\ \hline 13 \end{array} \Rightarrow A - C = ?$$

Yanıt / The Answer is 25

70. 23A ∈ N

$$\begin{array}{r} 23A \\ \times\ \ 7 \\ \hline \bullet\bullet 4 \bullet \end{array} \Rightarrow A = ?$$

Yanıt / The Answer is 5

71. AA, BB, AB ∈ N

$$\begin{array}{r} AA \\ -\ BB \\ \hline \bullet 8 \end{array} \Rightarrow AB = ?$$

Yanıt / The Answer is 91

72. ABC ∈ N, x ∈ N

$$\begin{array}{r} ABC \\ \times\ \ 14 \\ \hline 624 \\ \bullet\bullet\bullet\ \ \\ + \qquad \\ \hline x \end{array} \Rightarrow x = ?$$

Yanıt / The Answer is 2184

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73. AB ∈ N

$$\begin{array}{r} AB \\ \times \quad 3 \\ \hline 75 \end{array} \Rightarrow \mathbf{A + B = ?}$$

Yanıt / **The Answer is 7**

74. AB, 5C ∈ N

$$\begin{array}{r} AB \\ \times \quad 5C \\ \hline \bullet\bullet \\ +\; 75 \\ \hline \bullet\bullet\bullet \end{array} \Rightarrow \mathbf{B - A = ?}$$

Yanıt / **The Answer is 4**

75. AA, BB ∈ N

$$\begin{array}{r} AA \\ +\quad BB \\ \hline 187 \end{array} \Rightarrow \mathbf{A \cdot B = ?}$$

Yanıt / **The Answer is 72**

76. A, B ∈ N

$$\begin{array}{r} A \\ -\quad B \\ \hline 1 \end{array} \qquad \begin{array}{r} A \\ +\quad B \\ \hline 25 \end{array} \Rightarrow \mathbf{A = ?}$$

Yanıt / **The Answer is 13**

77. x, y ∈ Z, x + 2y = 11 olduğuna göre aşağıdakilerden hangisi <u>her zaman</u> doğrudur?

According to x, y ∈ Z > x + 2y = 11, which one of the followings is <u>always</u> true?

I. x tek sayıdır / x is odd number.

II. x > y

III. x ve y pozitif tam sayılardır / x and y are positive integers.

Yanıt / **The Answer is I**

78. a sayısı tek bir tam sayı ise aşağıdakilerden hangisi çift bir sayıdır?

If a is an odd integer, which one of the followings is an even number?

I. $2a^2 + 3a$

II. $3a^2 + 7a + 2$

III. $a^2 + a + 1$

Yanıt / **The Answer is II**

79. 3·(a – b) – 2 = 8c olduğuna göre aşağıdakilerden hangisi <u>kesinlikle</u> doğrudur?

According to this, which one of the followings is <u>absolutely</u> true?

I. b tek sayı ise a çift sayıdır.

If a is odd number, b is odd number.

II. a tek sayı ise b tek sayıdır.

If b is odd number, a is even number.

Yanıt / **The Answer is II**

80. a bir tam sayı olduğuna göre aşağıdakilerden hangisi <u>kesinlikle</u> tektir?

If is an integer, which one of the followings is <u>absolutely</u> odd number?

I. $a + 5$

II. $a - 4$

III. $a^2 - 7$

IV. $a^3 + a - 1$

Yanıt / **The Answer is IV**

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81. **a, b, c ∈ N, a + 3b = 2c + 4 olduğuna göre aşağıdakilerden hangisi her zaman çift sayıdır?**

According to a, b, c ∈ N, a + 3b = 2c + 4, which one of the followings is always even number?

I. a·b

II. a + b

III. a + c

IV. b·c

Yanıt / The Answer is II

82. **1 + 2 + 3 + ... + 19 = ?**

Yanıt / The Answer is 190

83. **1 + 3 + 5 + ... + 29 = ?**

Yanıt / The Answer is 225

84. **2 + 4 + 6 + ... + 32 = ?**

Yanıt / The Answer is 272

85. 1 + 2 + 3 + ... + n = 55 ⇒ **n = ?**

Yanıt / The Answer is 10

86. 1 + 3 + 5 + ... + 2n − 1 = 64 ⇒ **n = ?**

Yanıt / The Answer is 8

87. **21 + 22 + 23 + ... + 39 = ?**

Yanıt / The Answer is 570

88. **7 + 9 + 11 + ... + 25 = ?**

Yanıt / The Answer is 160

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89. $12 + 14 + 16 + ... + 40 = ?$

Yanıt / The Answer is 390

90. $1 + 5 + 9 ... + 45 = ?$

Yanıt / The Answer is 276

91. $21 + 27 + 33 + ... + 87 = ?$

Yanıt / The Answer is 648

92. $13 + 16 + 19 + ... + 55 = ?$

Yanıt / The Answer is 510

93. $11 + 15 + 19 + ... + 47 = ?$

Yanıt / The Answer is 290

94. **x ve y aralarında asal sayılardır.**

x and y relatively primes.

$\frac{x}{y} = \frac{42}{24} \Rightarrow x + y = ?$

Yanıt / The Answer is 11

95. $120 = a^3 \cdot b \cdot 5 \Rightarrow a + b = ?$

Yanıt / The Answer is 5

96. $72 = 2^x \cdot 3^y \Rightarrow x \cdot y = ?$

Yanıt / The Answer is 6

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97. $x,y,z \in N^+$

$180 = 2^x \cdot 3^y \cdot 5^z \Rightarrow$ **$x + y + z = ?$**

Yanıt / The Answer is 5

98. $m,n \in N^+$

$675 = 3^m \cdot 5^n \Rightarrow$ **$m + n = ?$**

Yanıt / The Answer is 5

99. $x,y,z \in N^+$

$240 = 2^x \cdot 3^y \cdot 5^z \Rightarrow$ **$x + y + z = ?$**

Yanıt / The Answer is 6

100. $A,x,y \in N^+$

$980 = A \cdot 5^x \cdot 7^y \Rightarrow$ **$\min(A) = ?$**

Yanıt / The Answer is 4

101. $A,x,y \in N^+$

$540 = A \cdot 2^x \cdot 3^y \Rightarrow$ **$\min(A) = ?$**

Yanıt / The Answer is 5

102. $A,B \in N^+$

$18 \cdot A = B^2 \Rightarrow$ **$\min(A + B) = ?$**

Yanıt / The Answer is 8

103. $A,B \in N^+$

$72 \cdot A = B^3 \Rightarrow$ **$\min(A) = ?$**

Yanıt / The Answer is 3

104. $x,y \in N^+$

$45 \cdot x = y^2 \Rightarrow$ **$\min(x + y) = ?$**

Yanıt / The Answer is 20

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105. 24 sayısının pozitif tam sayı bölenlerinin sayısı kaçtır?

What is the number of positive integer divisors of 24?

Yanıt / The Answer is 8

106. 340 sayısının tam sayı bölenlerinin sayısı kaçtır?

What is the number of integer divisors of 340?

Yanıt / The Answer is 24

107. $2! + 4! + 5! = ?$

Yanıt / The Answer is 146

108. $6! - 5! - 4! = ?$

Yanıt / The Answer is 576

109. $\frac{10!}{9!} + \frac{5!}{4!} = ?$

Yanıt / The Answer is 15

110. $\frac{12!}{10!} - \frac{8!}{6!} = ?$

Yanıt / The Answer is 76

111. $\frac{8! + 7!}{8! - 7!} = ?$

Yanıt / The Answer is $\frac{9}{7}$

112. $\frac{4! + 5! + 6!}{5! + 6!} = ?$

Yanıt / The Answer is $\frac{36}{35}$

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113. $\dfrac{5!+6!+7!}{7!-6!-5!}=?$

Yanıt / The Answer is $\frac{7}{5}$

114. $\dfrac{6!-2\cdot4!}{5!-4!}=?$

Yanıt / The Answer is 7

115. $\dfrac{30\cdot4!+6!}{6!-2\cdot5!}=?$

Yanıt / The Answer is 3

116. $\dfrac{10!-6\cdot8!}{56\cdot7!}=?$

Yanıt / The Answer is 12

117. $\dfrac{7!}{6!}+\dfrac{8!}{7!}+\dfrac{9!}{8!}+\ldots+\dfrac{n!}{(n-1)!}=84 \Rightarrow$ **n = ?**

Yanıt / The Answer is 14

118. $8!-k\cdot6!=6\cdot5! \Rightarrow$ **k = ?**

Yanıt / The Answer is 55

119. $12!+10!=1330\cdot a! \Rightarrow$ **a = ?**

Yanıt / The Answer is 9

120. $15!=\dfrac{a}{16} \Rightarrow$ **$17!-16!=?$**

Yanıt / The Answer is 16a

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121. $\dfrac{n!}{(n-1)!}=7 \Rightarrow$ **n = ?**

Yanıt / The Answer is 7

122. $\dfrac{(n+1)!}{n!}=5 \Rightarrow$ **n = ?**

Yanıt / The Answer is 4

123. $\dfrac{(n+3)!}{(n+1)!}=42 \Rightarrow$ **n = ?**

Yanıt / The Answer is 4

124. $\dfrac{(n+5)!}{(n+3)!}=90 \Rightarrow$ **n = ?**

Yanıt / The Answer is 5

125. $\dfrac{(n+1)!+3\cdot n!}{(n+1)!-n!}=2 \Rightarrow$ **n = ?**

Yanıt / The Answer is 4

126. $\dfrac{(n+2)!\cdot(n-1)!}{(n+1)!\cdot(n-2)!}=18 \Rightarrow$ **n = ?**

Yanıt / The Answer is 4

127. A, n ∈ N

$48! = A\cdot 10^n \Rightarrow$ **max(n) = ?**

Yanıt / The Answer is 10

128. A, n ∈ N

$100! = A\cdot 10^n \Rightarrow$ **max(n) = ?**

Yanıt / The Answer is 24

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129. A, n ∈ N

$38! = A \cdot 2^n \Rightarrow$ **max(n) = ?**

Yanıt / The Answer is 35

130. x,y ∈ N^+, A ∈ N^+

$27! = 2^x \cdot 3^y \cdot A \Rightarrow$ **max(x + y) = ?**

Yanıt / The Answer is 36

131. A, n ∈ N^+

$33! + 34! = A \cdot 10^n \Rightarrow$ **max(n) = ?**

Yanıt / The Answer is 8

132. x, y, z ∈ N^+

$12! = 2^x . 3^y . 5^z . A$

$\Rightarrow$ **min(A) = ?**

Yanıt / The Answer is 77

133. A = 72!

$A - 1 = \ldots\ldots \underbrace{999\ldots\ldots9}_{\text{n tane / n times}}$

$\Rightarrow$ **n = ?**

Yanıt / The Answer is 16

134. A = 45!

A - abc = ... 456

$\Rightarrow$ **a + b + c = ?**

Yanıt / The Answer is 13

135. A,x ∈ N

```
 A | 7
   |----
-  |
---
 x
```

$\Rightarrow$ **$\sum(x)$ = ?**

Yanıt / The Answer is 21

136. A ∈ N

```
 A | 5
   |----
   | 12
-  |
---
 3
```

$\Rightarrow$ **A = ?**

Yanıt / The Answer is 63

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137. A,B ∈ N

$$\begin{array}{r|l} A & B \\ \cline{2-2} - & 5 \\ \hline 2 & \end{array} \qquad \begin{array}{r|l} B & 4 \\ \cline{2-2} - & 3 \\ \hline 1 & \end{array} \quad \Rightarrow \quad A = ?$$

Yanıt / The Answer is 67

---

138. A,B ∈ N

$$\begin{array}{r|l} A+B & B \\ \cline{2-2} - & 7 \\ \hline 0 & \end{array} \qquad \begin{array}{r|l} A+B & A \\ \cline{2-2} - & \\ \hline K & \end{array} \quad \Rightarrow \quad K = ?$$

Yanıt / The Answer is B

---

139. A,B,C ∈ N

$$\begin{array}{r|l} A & B \\ \cline{2-2} - & 4 \\ \hline 0 & \end{array} \qquad \begin{array}{r|l} A & C \\ \cline{2-2} - & 2 \\ \hline 0 & \end{array} \quad \Rightarrow \quad \frac{C}{B} = ?$$

Yanıt / The Answer is 2

---

140. A,B ∈ N

$$\begin{array}{r|l} A & 15 \\ \cline{2-2} - & B \\ \hline 2B+1 & \end{array} \quad \Rightarrow \quad \sum(B) = ?$$

Yanıt / The Answer is 21

141.

$$\begin{array}{r|l} A & B+1 \\ \cline{2-2} - & 5 \\ \hline 3 & \end{array} \qquad \begin{array}{r|l} A+1 & 10 \\ \cline{2-2} - & 4 \\ \hline B-3 & \end{array} \quad \Rightarrow \quad A = ?$$

Yanıt / The Answer is 43

142.

$$\begin{array}{r|l} A & B \\ \cline{2-2} - & 5 \\ \hline 1 & \end{array} \qquad \begin{array}{r|l} B & 3 \\ \cline{2-2} - & \\ \hline 2 & \end{array} \qquad \begin{array}{r|l} A & 15 \\ \cline{2-2} - & \\ \hline k & \end{array}$$

$\Rightarrow$ **k = ?**

Yanıt / The Answer is 11

---

143. A,x ∈ N

$$\begin{array}{r|l} A & x \\ \cline{2-2} - & 5 \\ \hline 8 & \end{array} \quad \Rightarrow \quad \min(A) = ?$$

Yanıt / The Answer is 53

---

144. A,B,C ∈ N

$$\begin{array}{r|l} A & B \\ \cline{2-2} - & 7 \\ \hline 4 & \end{array} \qquad \begin{array}{r|l} C & 6 \\ \cline{2-2} - & 4 \\ \hline B & \end{array} \quad \Rightarrow \quad A + C = ?$$

Yanıt / The Answer is 68

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145. $B \in Z$

$$\begin{array}{r|l} A & B^2 \\ \hline - & 3 \\ 16 & \end{array} \Rightarrow \min(A) = ?$$

Yanıt / The Answer is 91

146. $1955A \in N$

$$\begin{array}{r|l} 1955A & 2 \\ \hline - & \\ 0 & \end{array} \Rightarrow \sum(A) = ?$$

Yanıt / The Answer is 20

147. $2018A \in N$

$$\begin{array}{r|l} 2018A & 2 \\ \hline - & \\ 1 & \end{array} \Rightarrow \sum(A) = ?$$

Yanıt / The Answer is 25

148. $6A2B \in N$

$A = B + 3$

$$\begin{array}{r|l} 6A2B & 2 \\ \hline - & \\ 0 & \end{array} \Rightarrow \sum(A) = ?$$

Yanıt / The Answer is 24

149. $21A53 \in N$

$$\begin{array}{r|l} 21A53 & 3 \\ \hline - & \\ 0 & \end{array} \Rightarrow \sum(A) = ?$$

Yanıt / The Answer is 12

150. $19A23 \in N$

$$\begin{array}{r|l} 19A23 & 3 \\ \hline - & \\ 2 & \end{array} \Rightarrow \sum(A) = ?$$

Yanıt / The Answer is 15

151. $1999A \in N$

$$\begin{array}{r|l} 1999A & 5 \\ \hline - & \\ 4 & \end{array} \Rightarrow \sum(A) = ?$$

Yanıt / The Answer is 13

152. $7ABC \in N$

$$\begin{array}{r|l} 7ABC & 5 \\ \hline - & \\ 0 & \end{array} \Rightarrow \max(A + B + C) = ?$$

Yanıt / The Answer is 23

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153. $35A7B \in N$

$$\begin{array}{r|l} 35A7B & 15 \\ \hline 0 & \end{array} \Rightarrow \max(A+B) = ?$$

Yanıt / The Answer is 12

154. $A, B \in N,$

$$\begin{array}{r|l} ab8x & 4 \\ \hline 3 & \end{array} \Rightarrow \sum x = ?$$

Yanıt / The Answer is 10

155. OBEB / GCF (36,60) = ?

Yanıt / The Answer is 12

156. OBEB / GCF (40,90,120) = ?

Yanıt / The Answer is 10

157. OKEK / LCM (20,16) = ?

Yanıt / The Answer is 80

158. OKEK / LCM (20,24,30) = ?

Yanıt / The Answer is 120

159. $A = \frac{150}{x}$, $B = \frac{120}{x}$, $C = \frac{90}{x}$

$x, A, B, C \in N^+ \Rightarrow \max(x) = ?$

Yanıt / The Answer is 30

160. $A = \frac{x}{60}$, $B = \frac{x}{50}$, $C = \frac{x}{24}$

$x, A, B, C \in N \Rightarrow \min(x) = ?$

Yanıt / The Answer is 600

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161. $A = 2^3 \cdot 3 \cdot 5$

$B = 2^2 \cdot 3^2 \cdot 5$ ⇒ **OBEB / GCF (A,B) = ?**

Yanıt / The Answer is 60

162. $A = 2^2 \cdot 3 \cdot 5$

$B = 2 \cdot 3^2 \cdot 7$ ⇒ **OKEK / LCM (A,B) = ?**

Yanıt / The Answer is 1260

163. OBEB / GCF (A,B) = 24

OKEK / LCM (A,B) = 360

A = 72 ⇒ **B = ?**

Yanıt / The Answer is 120

164. OBEB / GCF (48,A) = 12

OKEK(48,A) = 144 ⇒ **A = ?**

Yanıt / The Answer is 36

165. $A \neq B \in N$

OKEK / LCM (A,B) = 20 ⇒ **max(A + B) = ?**

Yanıt / The Answer is 30

166. OKEK / LCM (A,B) = 48 ⇒ **min(A + B) = ?**

Yanıt / The Answer is 19

167. $A,B \in N$

OBEB / GCF (A,B) = 8

OKEK / LCM (A,B) = 48 ⇒ **min(A + B) = ?**

Yanıt / The Answer is 40

168. $A \in N$, $a,b,c, \in N^+$

$A = 3a + 2 = 4b + 2 = 5c + 2$ ⇒ **min(A) = ?**

Yanıt / The Answer is 62

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169. $A = 3k + 1 = 4m + 1 = 7n + 1$

$\Rightarrow$ **min(A) = ?**

Yanıt / The Answer is 85

170. $A = 4k + 2 = 6m + 4 = 10n + 8$

$150 < A < 200 \quad \Rightarrow$ **min(A) = ?**

Yanıt / The Answer is 178

171. $A \in N$, $a, b, c \in N^+$

$A = 6a + 4 = 8b + 6 = 10c + 8$

$900 < A < 1000 \quad \Rightarrow$ **A = ?**

Yanıt / The Answer is 958

172. $a, b, c \in N$

$x = 3a + 2 = 5b + 4 = 8c + 7$

$\Rightarrow$ **min(x) = ?**

Yanıt / The Answer is 119

173. $a, b \in Z^+$

OKEK / LCM (a, b) = 150

$3a = 10b$

$\Rightarrow$ **OBEB / GCF (a, b) = ?**

Yanıt / The Answer is 5

174. Boyutları 24 m ve 60 m olan dikdörtgen bir tarlanın köşelerine ve çevresine eşit aralıklarla ağaç dikilecektir. En az kaç ağaç gerekir?

Edges of a rectangular shaped garden with dimensions of 24 m and 60 m is going to be planted by trees in equal distances. At least how many trees are needed?

Yanıt / The Answer is 14

175. Boyutları 120 m ve 48 m olan dikdörtgen bir arsa kare biçiminde eş parsellere ayrılacaktır. En az kaç parsel elde edilir?

A rectangular shaped land with dimensions of 120 m and 48 m is going to split up to equal square parcels. At lease how many parcels are obtained?

Yanıt / The Answer is 10

176. Boyutları 18 cm, 24 cm ve 30 cm olan dikdörtgenler prizması şeklindeki tuğlalar kullanılarak içi dolu bir küp yapılacaktır. En az kaç tuğla gerekir?

Using bricks with dimensions of 18, 24, and 30 cm, a full bodied cube prism is going to form. At least how many bricks are needed?

Yanıt / The Answer is 3600

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1. $\left.\begin{array}{l} A+5B=30 \\ 5A+B=6 \end{array}\right\} \Rightarrow \mathbf{A+B=?}$

A) 4 B) 6 C) 8 D) 10 E) 12

2. $\left.\begin{array}{l} 2A+3B=18 \\ 2B+3A=22 \end{array}\right\} \Rightarrow \mathbf{A+B=?}$

A) 6 B) 7 C) 8 D) 9 E) 10

3. $(ab) \in N$,

$\left.\begin{array}{l} a \cdot k=12 \\ b \cdot k=27 \end{array}\right\} \Rightarrow \mathbf{k \cdot (ab)=?}$

A) 127 B) 133 C) 140 D) 144 E) 147

4. $(AB), (CD) \in N$,

$\left.\begin{array}{l} A \cdot (CD)=56 \\ B \cdot (CD)=42 \end{array}\right\} \Rightarrow \mathbf{CD \cdot AB=?}$

A) 602 B) 603 C) 604 D) 605 E) 606

5. x, y, z birer rakam olmak üzere

$x \neq y \neq z$

$2x+3y+5z=62 \Rightarrow \mathbf{max(z)=?}$

A) 5 B) 6 C) 7 D) 8 E) 9

6. $A, B, D, C, F \in N$

$(A+B) \cdot (D-C) = 42$

$$\begin{array}{r} A \\ -\ B \\ \hline B \end{array} \qquad \begin{array}{r} D \\ -\ C \\ \hline 2F \end{array} \Rightarrow \mathbf{B+F=?}$$

A) 7 B) 8 C) 9 D) 10 E) 12

7. $x, y \in Z^{+}$,

$x+y=15 \Rightarrow \mathbf{min\left(\frac{x \cdot y}{7}\right)=?}$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $x, y \in Z^{+}$,

$x+y=16 \Rightarrow \mathbf{max\left(\frac{x \cdot y}{16}\right)=?}$

A) 4 B) 5 C) 6 D) 7 E) 8

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9. $A, B \in N^+$,

$A + B = 18 \Rightarrow$ **max(A·B) + min(A·B) = ?**

A) 101 B) 100 C) 99 D) 98 E) 97

10. $A, B \in N^+$,

$A \cdot B = 36 \Rightarrow$ **max(A + B) + min(A + B) = ?**

A) 45 B) 48 C) 49 D) 52 E) 56

11. $A, B \in N$, $A \neq B$

$A + B = 42 \Rightarrow$ **max(A·B) + min(A·B) = ?**

A) 440 B) 452 C) 462 D) 481 E) 484

12. $A, B \in N^+$,

$A + B = 16 \Rightarrow$ **max(A·B) – min(A·B) = ?**

A) 49 B) 50 C) 51 D) 52 E) 53

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13. $A, B \in N^+$,

$A \cdot B = 57 \Rightarrow$ **max(A + B) + min(A + B) = ?**

A) 50 B) 60 C) 70 D) 80 E) 90

14. $a, b, c \in Z^+$,

$a + b + c = 17 \Rightarrow$ **min(a·b·c) = ?**

A) 15 B) 17 C) 20 D) 24 E) 28

15. $a, b, c \in N^+$,

$a + b + c = 68 \Rightarrow$ **min(a·b·c) = ?**

A) 56 B) 60 C) 64 D) 66 E) 68

16. $x, y, z \in Z^+$,

$x \cdot y + y \cdot z = 28$

$\Rightarrow$ **max(x·y·z) = ?**

A) 144 B) 156 C) 168 D) 196 E) 198

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	C	E	A	E	B	B	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	C	A	A	D	A	D	D

1. $[12.(5-3)]-[12:2+1]=?$

A) 19 B) 18 C) 17 D) 16 E) 15

2. $20-[(22+8):3]=?$

A) 8 B) 9 C) 10 D) 11 E) 12

3. $[24:(-3)-(-5)\cdot(-2)]:[20-4\cdot 3+1]=?$

A) –2 B) –1 C) 0 D) 1 E) 2

4. $(135:5-9\cdot 3+1)\cdot(144:12-2\cdot 5)=?$

A) 1 B) 2 C) 3 D) 4 E) 5

5. $\dfrac{(-5)\cdot(5)-3\cdot 3+4}{3\cdot 5-5\cdot 8-5}=?$

A) –2 B) –1 C) 0 D) 1 E) 2

6. $18-2\cdot 4+5\cdot 4-10=?$

A) 74 B) 60 C) 48 D) 24 E) 20

7. $12:3-\{[(-1)-(-2)-(-3)]-2\}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $5+3\cdot 4-18:6+[2(7+8:4)]=?$

A) 22 B) 24 C) 26 D) 28 E) 32

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9. $-3 + 2 - 4 \cdot (6 : 3 - 7 + 12) = ?$

A) –29 B) –27 C) –25 D) –23 E) –21

10. $[8 : 4 - (6 : 3) + 12 \cdot 3] + (30 : 6) \cdot 4 = ?$

A) 2 B) 18 C) 36 D) 41 E) 56

11. $[16 : 4 - 4 \cdot 3 + 20] - 20 : 4 = ?$

A) 1 B) 3 C) 7 D) 9 E) 13

12. $10 - 4 : 2 - (3 + 2 \cdot 6) = ?$

A) –3 B) –4 C) –5 D) –6 E) –7

13. $[44 : 11 - 18 : 6 - 1] \cdot [654 : 2 - 91 \cdot 5] = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

14. $[24 - 4(11 - 27 : 9) - (-7)] - 3 \cdot 2 = ?$

A) –1 B) –3 C) –5 D) –7 E) –9

15. $16 - (8 : 2) + 12 : (-2) + 20 : 4 - 5 = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

16. $[\,[14 : 2 - 5] + [6 + 4 : 2] - 3\,] . 2 = ?$

A) 11 B) 12 C) 13 D) 14 E) 15

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1	2	3	4	5	6	7	8
C	C	A	B	D	E	B	E
9	10	11	12	13	14	15	16
A	E	C	E	C	D	E	D

1. $5 - (8 : 4 + 4) + 8 : 2 + 3 = ?$

A) 5 B) 6 C) 7 D) 8 E) 9

2. $1 - [18 - 18 : 2 + 3 - (6 - 4) : 2)] = ?$

A) –10 B) –8 C) 0 D) 8 E) 10

3. $88:(8 + 3) + 6 - 2.2 = ?$

A) 6 B) 8 C) 10 D) 12 E) 14

4. $(2^3.3 - 8:4) : (10 + 1) = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

5. $1.3 + (12 - 8 : 4) : 5 = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

6. $[8 : 4 - (6 : 3) + 12{\cdot}3] + (30 : 6){\cdot}4 = ?$

A) 40 B) 44 C) 48 D) 52 E) 56

7. $[16 : 4 - 4{\cdot}3 + 20] - 20 : 4 = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

8. $[44 : 11 - 18 : 6 - 1]{\cdot}[654 : 2 - 91{\cdot}5] = ?$

A) –8 B) –6 C) 0 D) 6 E) 8

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9. $-[-9 + (-3) : 3 - (-2 + 5)] = ?$

A) 10 B) 13 C) 15 D) 17 E) 19

10. $a = 2$

$b = 5$

$\Rightarrow (a \cdot b - 3a + 2b) \cdot 4 = ?$

A) 56 B) 55 C) 54 D) 32 E) 16

11. $a = -3$

$b = 2$

$\Rightarrow (-a \cdot b - 4b + 5a) = ?$

A) –13 B) –17 C) –18 D) –19 E) –20

12. $a = -2$

$b = -4$

$\Rightarrow [(-a) + 2b] : [-(-b) : a + 1] = ?$

A) –2 B) –3 C) –4 D) –5 E) –6

13. $2 + 3 \cdot (4 + 5) \cdot (3 + 4 \cdot 5) = ?$

A) 600 B) 610 C) 623 D) 625 E) 621

14. $6 - 3 \cdot (15 : 5 - 3 : 3 + 4 \cdot 6) = ?$

A) –24 B) –36 C) –72 D) –96 E) –108

15. $7 + 2 \cdot (2 - 3 \cdot 4 + 4 - 3 \cdot 5) = ?$

A) –19 B) –35 C) –25 D) –55 E) –75

16. $75 - 3 \cdot 2 \cdot (42 : 2 - 7 \cdot 3) - 4 \cdot (5 \cdot 3 - 8) = ?$

A) 40 B) 42 C) 45 D) 46 E) 47

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	A	C	B	D	E	E	C
9	10	11	12	13	14	15	16
B	A	B	A	C	C	B	E

1. (AB), (BA) $\in$ N,

AB + BA = 77 $\Rightarrow$ **A + B = ?**

A) 3 B) 5 C) 7 D) 9 E) 11

2. (AB), (BA) $\in$ N,

AB – BA = 54 $\Rightarrow$ **A – B = ?**

A) 2 B) 4 C) 6 D) 7 E) 8

3. (AB), (BA), (BB) $\in$ N,

AB + BA – BB = 44 $\Rightarrow$ **A = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

4. (AB), (BA), (AA) $\in$ N,

AB + BA – AA = 33 $\Rightarrow$ **B = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

5. A, B $\in$ N^+,

(aa)a = 99 $\Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

6. ABC, BCA, CAB $\in$ N

A + B + C = 7

$\Rightarrow$ **ABC + BCA + CAB = ?**

A) 777 B) 666 C) 444 D) 333 E) 555

7. (ABC), (BCA), (CAB) $\in$ N,

A + B + C = 5 $\Rightarrow$ **ABC + BCA + CAB = ?**

A) 444 B) 445 C) 525 D) 545 E) 555

8. (A0B), (BA0) $\in$ N,

A0B + BA0 = 211 $\Rightarrow$ **AB = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

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9. (3ab), (abc) $\in$ N,

3ab – abc = 145

$\Rightarrow$ **a + b + c = ?**

A) 8 B) 10 C) 12 D) 14 E) 16

10. (AB), (BA) $\in$ N,

AB – BA = 45 $\Rightarrow$ **min(A) = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

11. AB + BA = 110 $\Rightarrow$ **max(AB) = ?**

A) 91 B) 82 C) 73 D) 64 E) 55

12. (ab), (ba) $\in$ N,

ab + ba = 5(a + b) +72

$\Rightarrow$ **a + b = ?**

A) 12 B) 14 C) 16 D) 18 E) 20

13. (AB), (BA), (CC) $\in$ N,

AB + BA + CC = 121 $\Rightarrow$ **max(ABC) = ?**

A) 821 B) 831 C) 841 D) 911 E) 921

14. (AB), (BA) $\in$ N,

AB + BA = 77,

AB – BA = 45 $\Rightarrow$ **A·B = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

15. (AB), (BA) $\in$ N,

AB + BA = 99 , $\frac{AB}{BA} = \frac{7}{4}$ $\Rightarrow$ **A·B = ?**

A) 14 B) 16 C) 18 D) 20 E) 24

16. (ab), (ba) $\in$ N,

$\frac{ab + ba}{ab - ba} = \frac{11}{5}$ $\Rightarrow$ **a – b = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	C	D	C	C	A	E	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	B	A	A	D	C	C	B

1. $(ABA), (BAB) \in N$,

$ABA + BAB = 1221 \Rightarrow$ **max(A) + min(A) = ?**

A) 12 B) 11 C) 10 D) 9 E) 8

2. $A \neq B \neq C$, $(ABA), (BAB) \in N$,

$ABA + BAB = 1221 \Rightarrow$ **max(ABC) = ?**

A) 998 B) 988 C) 928 D) 987 E) 897

3. $(ABC), (CBA), \in N$,

$ABC - CBA = 495 \Rightarrow$ **max(ABC) = ?**

A) 994 B) 984 C) 895 D) 498 E) 495

4. $ABC, CBA \in N$

$ABC - CBA = 396$

$\Rightarrow$ **max(A + B + C) = ?**

A) 15 B) 17 C) 18 D) 21 E) 23

5. $a \neq b$, $(abc), (cba) \in N$,

$abc - cba = 396 \Rightarrow$ **max(a + b + c) = ?**

A) 18 B) 20 C) 22 D) 24 E) 26

6. $(ab), (cd) \in N$,

$(ab) \cdot d = 185$

$(ab) \cdot c = 111$

$\Rightarrow$ **(ab)·(cd) = ?**

A) 1165 B) 1185 C) 1265 D) 1295 E) 1315

7. $ABC, CBA \in N$

$ABC = CBA + 693 \Rightarrow$ **A – C = ?**

A) 5 B) 7 C) 9 D) 11 E) 13

8. $(ABAB), (AB) \in N$

$\Rightarrow \dfrac{ABAB + AB}{3 \cdot (AB)} = ?$

A) 32 B) 34 C) 36 D) 40 E) 44

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9. $(AB), (BA) \in N$,

$AB = BA + 27 \Rightarrow$ **min(AB) = ?**

A) 30 B) 41 C) 52 D) 63 E) 74

10. $(AB), (BA) \in N$,

$AB + BA = 7(A + B) + 32 \Rightarrow$ **max(AB) = ?**

A) 92 B) 80 C) 71 D) 62 E) 53

11. $(AB), (BA) \in N$,

$AB + BA = 3\cdot(AA) \Rightarrow \sum A = ?$

A) 6 B) 7 C) 8 D) 9 E) 10

12. $(AB), (BA) \in N$,

$AB + 37 = 3\cdot(BA) \Rightarrow$ **A + B = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

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13. $(AB) \in N$,

$8(A + B) = AB \Rightarrow$ **A·B = ?**

A) 10 B) 12 C) 14 D) 18 E) 24

14. $(AB), (BA) \in N$,

$AB + BA = 99$

$\frac{AB}{BA} = \frac{6}{5} \Rightarrow$ **A·B = ?**

A) 18 B) 19 C) 20 D) 21 E) 22

15. $(AB), (BA), (BB) \in N$,

$\frac{AB + BA}{BB} = 3 \Rightarrow$ **max(A – B) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

16. **$a \neq b$, aba ve bab üç basamaklı doğal sayılardır.**

aba + bab = 1665 olduğuna göre, a · b çarpımının <u>en büyük</u> <u>değeri</u> kaçtır?

$a \neq b$, aba and bab are three-digit natural numbers. If the sum aba + bab = 1665, what is the <u>largest value</u> of the product a · b?

A) 36 B) 42 C) 49 D) 56 E) 63

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1	2	3	4	5	6	7	8
B	C	A	E	C	D	B	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	C	E	B	C	C	D	D

1. $(324)_5 = (x)_{10} \Rightarrow$ **x = ?**

A) 89 B) 79 C) 69 D) 59 E) 49

2. $(234)_6 = (x)_{10} \Rightarrow$ **x = ?**

A) 92 B) 94 C) 96 D) 98 E) 100

3. $(1203)_4 = (x)_{10} \Rightarrow$ **x = ?**

A) 79 B) 83 C) 89 D) 96 E) 99

4. $(1023)_4 = (x)_{10} \Rightarrow$ **x = ?**

A) 74 B) 75 C) 76 D) 77 E) 78

5. $(24)_5 + (41)_6 = x \Rightarrow$ **x = ?**

A) 36 B) 37 C) 38 D) 39 E) 40

6. $(101)_2 + (201)_3 + (111)_4 = (x)_{10} \Rightarrow$ **x = ?**

A) 36 B) 41 C) 45 D) 49 E) 54

7. $(142)_6 + (214)_5 + (113)_4 = (x)_{10} \Rightarrow$ **x = ?**

A) 144 B) 128 C) 124 D) 121 E) 71

8. $(102)_3 + (203)_4 = (x)_{10} \Rightarrow$ **x = ?**

A) 45 B) 46 C) 47 D) 48 E) 49

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9. $(1231)_4 + (1011)_2 = (4a0)_5 \Rightarrow$ **a = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

10. $(54)_x = (A)_{10} \Rightarrow$ **min(A) = ?**

A) 30 B) 31 C) 32 D) 33 E) 34

11. $(46)_x = (A)_{10} \Rightarrow$ **min(A) = ?**

A) 30 B) 31 C) 32 D) 33 E) 34

12. $x \in Z$,

$(111)_3 \leq (x)_{10} < (122)_3 \Rightarrow \sum x = ?$

A) 50 B) 54 C) 56 D) 58 E) 60

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13. $(15a)_6 = (241)_a \Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

14. $(3a4)_6 + (114)_a = (x)_{10} \Rightarrow$ **x = ?**

A) 170 B) 174 C) 176 D) 180 E) 182

15. $(x43)_6 + (432)_x = (A)_{10} \Rightarrow$ **A = ?**

A) 322 B) 323 C) 324 D) 325 E) 326

16. $(1b14)_5 = (b53)_7 \Rightarrow$ **b = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

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1	2	3	4	5	6	7	8
A	B	E	B	D	C	A	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
E	E	E	D	E	C	C	E

1. $(2a5)_7 = (131)_{10} \Rightarrow$ **a = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

2. $(2n5)_6 = (83)_{10} \Rightarrow$ **n = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $(a4a)_5 = (200)_6 \Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

4. $\sqrt{(144)_a} = (14)_5 \Rightarrow$ **a = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

5. $(235)_7 = (a4a)_5 \Rightarrow$ **a = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

6. $(4ab)_6 = 162 \Rightarrow$ **a + b = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

7. $(134)_n = 58 \Rightarrow$ **n = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

8. $(abb)_5 = (bba)_6 \Rightarrow$ **a·b = ?**

A) 6 B) 10 C) 12 D) 15 E) 16

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9. $(21,5)_6 = (x)_{10} \Rightarrow$ **x = ?**

A) $\frac{40}{3}$ B) $\frac{27}{2}$ C) $\frac{41}{3}$ D) $\frac{83}{6}$ E) 14

10. $(a3)_{a+1} = 5 \cdot a \Rightarrow$ **a = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

11. $(1a)_5 + (31)_{a+2} = (A)_{10} \Rightarrow$ **max(A) = ?**

A) 26 B) 28 C) 30 D) 32 E) 34

12. $\left.\begin{array}{l} x = (54)_a \\ x = (47)_{a+1} \end{array}\right\} \Rightarrow$ **x = ?**

A) 32 B) 36 C) 39 D) 40 E) 44

13. $(14)_x + (25)_x = (41)_x \Rightarrow$ **x = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

14. $(ab)_6 + (ba)_7 = (1ab)_6 \Rightarrow$ **a + b = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

15. $(10,11)_3 = (A)_{10} \Rightarrow$ **A = ?**

A) $\frac{29}{9}$ B) $\frac{10}{3}$ C) $\frac{31}{9}$ D) $\frac{32}{9}$ E) $\frac{11}{3}$

16. $(21,5)_6 = (x)_{10} \Rightarrow$ **x = ?**

A) $\frac{40}{3}$ B) $\frac{27}{2}$ C) $\frac{41}{3}$ D) $\frac{83}{6}$ E) 14

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	A	B	C	E	A	B	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	A	B	C	C	A	C	D

1. $(56)_{10} = (x)_5 \Rightarrow$ **x = ?**

A) 209 B) 210 C) 211 D) 212 E) 213

2. $(94)_{10} = (x)_5 \Rightarrow$ **x = ?**

A) 334 B) 343 C) 321 D) 304 E) 244

3. $(46)_{10} = (x)_4 \Rightarrow$ **x = ?**

A) 233 B) 232 C) 230 D) 133 E) 132

4. $(49)_{10} = (x)_6 \Rightarrow$ **x = ?**

A) 102 B) 100 C) 101 D) 121 E) 210

5. $(108)_{10} = (x)_7 \Rightarrow$ **x = ?**

A) 102 B) 100 C) 101 D) 121 E) 213

6. $(111)_{10} = (x)_5 \Rightarrow$ **x = ?**

A) 331 B) 342 C) 343 D) 411 E) 421

7. $(86)_9 = (x)_7 \Rightarrow$ **x = ?**

A) 126 B) 134 C) 141 D) 146 E) 151

8. $(68)_9 = (x)_5 \Rightarrow$ **x = ?**

A) 224 B) 223 C) 222 D) 221 E) 220

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9. $(77)_8 = (x)_6 \Rightarrow$ **x = ?**

A) 140 B) 141 C) 142 D) 143 E) 144

10. $9^3 + 2{\cdot}9 + 8 = (A)_9 \Rightarrow$ **A = ?**

A) 1028 B) 1208 C) 1008 D) 1080 E) 1128

11. $2^5 + 2^3 + 3 = (A)_4 \Rightarrow$ **A = ?**

A) 220 B) 221 C) 203 D) 223 E) 232

12. $A = 4^2 + 4 + 1 \Rightarrow$ **$(A)_2$ = ?**

A) 111 B) 1011 C) 1010 D) 10101 E) 11010

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13. $A = 4{\cdot}6^5 + 2{\cdot}6^4 + 3{\cdot}6^3 + 2{\cdot}6^2 + 6 + 4 \Rightarrow$ **$(A)_6$ = ?**

A) 432214 B) 42324 C) 423241 D) 423214 E) 43214

14. $4^4 = (A)_4 \Rightarrow$ **A = ?**

A) 1000 B) 10000 C) 100000 D) 3333 E) 33333

15. $9^3 + 1 = (x)_9 \Rightarrow$ **x = ?**

A) 1010 B) 1000 C) 1110 D) 1001 E) 1111

16. $2^{10} = (x)_4 \Rightarrow$ **x = ?**

A) 100 B) 1000 C) 10000 D) 100000 E) 1000000

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1	2	3	4	5	6	7	8
C	A	B	D	E	E	C	C
9	10	11	12	13	14	15	16
D	A	D	D	D	B	D	D

1. $4^2 + 4 + 3 = (A)_2 \Rightarrow$ **A = ?**

A) 10111 B) 11011 C) 11101 D) 11110 E) 11111

2. $x \in N^+$,

$2x^3 + x + 1 = (A)_x \Rightarrow$ **A = ?**

A) 1010 B) 2010 C) 2011 D) 2101 E) 211

3. $x^3 + 3x^2 + 3x + 2 = (A)_{x+1} \Rightarrow$ **A = ?**

A) 100 B) 101 C) 102 D) 1001 E) 1002

4. $a > 4$,

$(4a^2 + a)_{10} = (x)_a \Rightarrow$ **x = ?**

A) 321 B) 334 C) 242 D) 410 E) 411

5. $\frac{33}{2} = (A)_6 \Rightarrow$ **A = ?**

A) 24,3 B) 23,4 C) 21,4 D) 24,4 E) 24,9

6. $(47)_8 + (36)_8 + (24)_8 = (x)_8 \Rightarrow$ **x = ?**

A) 123 B) 131 C) 137 D) 141 E) 146

7. $(1023)_6 - (515)_6 = (x)_6 \Rightarrow$ **x = ?**

A) 104 B) 204 C) 210 D) 230 E) 240

8. $(44)_5 + (32)_5 + (14)_5 = (x)_5 \Rightarrow$ **x = ?**

A) 134 B) 144 C) 200 D) 234 E) 244

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9. $(36)_8 + (42)_8 = (x)_8 \Rightarrow$ **x = ?**

A) 77 B) 100 C) 117 D) 127 E) 137

10. $(426)_8 - (137)_8 = (x)_8 \Rightarrow$ **x = ?**

A) 267 B) 266 C) 265 D) 264 E) 263

11. $(12)_3 + (20)_3 + (22)_3 = (x)_3 \Rightarrow$ **x = ?**

A) 102 B) 200 C) 201 D) 202 E) 221

12. $(478)_9 - (288)_9 = (A)_9 \Rightarrow$ **A = ?**

A) 180 B) 181 C) 182 D) 183 E) 184

13. $\dfrac{(xx)_5 + (yy)_5 + (zz)_5}{x + y + z} = ?$

A) 4 B) 6 C) 8 D) 10 E) 12

14. $(25)_7 \cdot (16)_7 = (x)_7 \Rightarrow$ **x = ?**

A) 401 B) 431 C) 440 D) 456 E) 502

15. $(35)_7 \cdot (42)_7 = (A)_7 \Rightarrow$ **A = ?**

A) 2166 B) 2163 C) 2056 D) 2053 E) 2050

16. $(34)_5 \cdot (33)_5 = (A)_5 \Rightarrow$ **A = ?**

A) 2332 B) 2232 C) 2132 D) 2333 E) 3232

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	C	D	D	A	B	A	C
9	10	11	12	13	14	15	16
B	A	C	A	B	E	B	A

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1. $1 + 2 + 3 + 4 + \ldots + 25 = ?$

A) 320 B) 325 C) 330 D) 335 E) 340

2. $1 + 2 + 3 + \ldots + 26 = ?$

A) 321 B) 335 C) 341 D) 345 E) 351

3. $2 + 4 + 6 + \ldots + 38 = ?$

A) 190 B) 230 C) 300 D) 380 E) 400

4. $2 + 4 + 6 + \ldots + 28 = ?$

A) 200 B) 206 C) 210 D) 214 E) 218

5. $2 + 4 + 6 + \ldots + 44 = ?$

A) 502 B) 504 C) 506 D) 508 E) 510

6. $2 + 4 + 6 + \ldots + 30 = ?$

A) 220 B) 230 C) 240 D) 250 E) 260

7. $1 + 3 + 5 + \ldots + 23 = ?$

A) 100 B) 121 C) 144 D) 169 E) 225

8. $1 + 3 + 5 + 7 + \ldots + 47 = ?$

A) 529 B) 538 C) 557 D) 564 E) 576

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9. **1 + 3 + 5 + ... + 21 = ?**

A) 120 B) 121 C) 122 D) 123 E) 124

10. **1 + 3 + 5 + ... + 49 = ?**

A) 576 B) 595 C) 615 D) 625 E) 636

11. **5 + 6 + 7 + ... + 24 = ?**

A) 280 B) 290 C) 300 D) 310 E) 320

12. **16 + 17 + 18 + ... + 32 = ?**

A) 408 B) 404 C) 400 D) 396 E) 392

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13. **14 + 15 + 16 + ... + 28 = ?**

A) 270 B) 285 C) 300 D) 315 E) 320

14. **12 + 14 + 16 + ... + 40 = ?**

A) 378 B) 382 C) 386 D) 390 E) 394

15. **12 + 14 + 16 + ... + 36 = ?**

A) 312 B) 318 C) 324 D) 330 E) 336

16. **13 + 15 + 17 + ... + 37 = ?**

A) 300 B) 305 C) 310 D) 315 E) 325

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	E	D	C	C	C	C	E
9	10	11	12	13	14	15	16
B	D	B	A	D	D	A	E

1. $9 + 11 + 13 + \ldots + 29 = ?$

A) 203 B) 205 C) 207 D) 209 E) 211

2. $1 + 2 + 3 + \ldots + n = 136 \Rightarrow n = ?$

A) 16 B) 17 C) 18 D) 19 E) 20

3. $1 + 2 + 3 + 4 + \ldots + n = 300 \Rightarrow n = ?$

A) 15 B) 18 C) 21 D) 24 E) 27

4. $1 + 2 + 3 + \ldots + n = 210 \Rightarrow n = ?$

A) 18 B) 19 C) 20 D) 21 E) 22

5. $2 + 4 + 6 + \ldots + 2n = 110 \Rightarrow n = ?$

A) 5 B) 10 C) 15 D) 20 E) 25

6. $15 + 17 + \ldots + 2n - 1 = 851 \Rightarrow n = ?$

A) 25 B) 30 C) 32 D) 35 E) 40

7. $5 + 6 + 7 + \ldots + n = 45 \Rightarrow n = ?$

A) 7 B) 8 C) 9 D) 10 E) 11

8. $10 + 12 + 14 + \ldots + 2n = 70 \Rightarrow n = ?$

A) 3 B) 6 C) 9 D) 12 E) 15

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9. $7 + 9 + 11 + ... + 2n - 1 = 135 \Rightarrow$ **n = ?**

A) 12 B) 10 C) 8 D) 6 E) 4

10. $1 \cdot a + 2 \cdot a + 3 \cdot a + ... + 20 \cdot a = 105 \Rightarrow$ **a = ?**

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 3

11. $a + (a + 1) + (a + 2) + ... + (a + 12) = 130$

$\Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

12. $a + (a + 1) + (a + 2) + ... + (a + 17) = 207$

$\Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

13. $-10 - 8 - 6 - ... - 2 + 1 + 3 + 5 + ... + 23 = ?$

A) 110 B) 111 C) 112 D) 113 E) 114

14. $a + a + 2 + a + 4 + ... + a + 24 = 169$

$\Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

15. $2n + (2n + 1) + (2n + 2) + ... + (2n + 12) = 52$

$\Rightarrow$ **n = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

16. $12 + 14 + 16 + ... + K = 390$

$\Rightarrow$ **K = ?**

A) 36 B) 37 C) 38 D) 39 E) 40

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	A	D	C	B	B	D	C
9	10	11	12	13	14	15	16
A	B	D	C	E	A	B	E

1. **7 + 14 + ... + 140 = ?**

A) 1390 B) 1410 C) 1460 D) 1470 E) 1500

2. **12 + 15 + 18 + ... + 54 = ?**

A) 490 B) 495 C) 500 D) 505 E) 510

3. **6 + 11 + 16 + ... + 66 = ?**

A) 468 B) 464 C) 460 D) 456 E) 452

4. **7 + 11 + 15 + ... + 79 = ?**

A) 811 B) 814 C) 817 D) 820 E) 823

5. **–12 – 5 + 2 + 9 + ... + 79 = ?**

A) 460 B) 463 C) 466 D) 469 E) 472

6. **6 + 12 + 18 + ... + 96 = ?**

A) 814 B) 815 C) 816 D) 817 E) 818

7. **5 + 12 + 19 + 26 + ... + 75 = ?**

A) 435 B) 440 C) 445 D) 450 E) 455

8. **–8 – 5 – 2 + 1 + 4 + ... + 25 = ?**

A) 100 B) 101 C) 102 D) 103 E) 104

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9. $1 - 2 + 3 - 4 + \ldots + 29 - 30 = ?$

A) –11 B) –12 C) –13 D) –14 E) –15

10. $-1 - 2 - 3 - \ldots - 14 + 15 + 14 + \ldots + 3 = ?$

A) 12 B) 13 C) 14 D) 15 E) 16

11. $1 - 2 + 3 - 4 + 5 - 6 + \ldots + 31 - 32 = ?$

A) –12 B) –14 C) –16 D) –18 E) –20

12. $4 - 5 + 6 - 7 + 8 - 9 + \ldots + 18 - 19 + 20 = ?$

A) 10 B) 11 C) 12 D) 13 E) 14

13. $2 - 4 + 6 - 8 + \ldots + 42 - 44 + 46 = ?$

A) –24 B) –20 C) 20 D) 23 E) 24

14. $6 - 7 + 8 - 9 + \ldots + 20 - 21 + 17 = ?$

A) 1 B) 3 C) 5 D) 7 E) 9

15. $1 - 4 + 7 - 10 + \ldots + 91 - 94 + 97 = ?$

A) 54 B) 49 C) 0 D) –49 E) –54

16. $15 - 18 + 21 - 24 + 27 - 30 + \ldots + 63 - 66 = ?$

A) –27 B) –17 C) 0 D) 17 E) 27

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	B	A	C	D	C	B	C
9	10	11	12	13	14	15	16
E	A	C	C	E	E	B	A

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1. $A = 1 \cdot 2 + 2 \cdot 3 + 3 \cdot 4 + \ldots + 10 \cdot 11$

$B = 3 \cdot 8 + 6 \cdot 12 + 9 \cdot 16 + \ldots + 30 \cdot 44$

$\Rightarrow \frac{B}{A} = ?$

A) 3 B) 4 C) 6 D) 12 E) 16

2. $A = 10 + 20 + \ldots + 110$

$B = 8 + 16 + \ldots + 88$

$\Rightarrow \frac{A}{B} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{3}{4}$ D) 1 E) $\frac{5}{4}$

3. $\frac{4+8+12+\ldots+104}{3+6+9+\ldots+78} = ?$

A) 1 B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) $\frac{4}{3}$ E) $\frac{3}{4}$

4. $A = 4 + 5 + 6 + \ldots + 18$

$B = 5 + 8 + 11 + \ldots + 47$

$\Rightarrow B - A = ?$

A) 200 B) 205 C) 215 D) 220 E) 225

5. $A = 12 + 13 + 14 + \ldots + n$

$B = 1 + 2 + 3 + 4 + \ldots + n$

$\Rightarrow B - A = ?$

A) 54 B) 56 C) 62 D) 64 E) 66

6. $A = 1 + 3 + 5 + \ldots + 25$

$B = 2 + 4 + 6 + \ldots + 26 \Rightarrow B - A = ?$

A) 11 B) 12 C) 13 D) 14 E) 15

7. $\frac{1}{5} + \frac{2}{5} + \frac{3}{5} + \ldots + \frac{14}{5} = A$

$\frac{1}{6} + \frac{3}{6} + \frac{5}{6} + \ldots + \frac{11}{6} = B$

$\Rightarrow A - B = ?$

A) 5 B) 10 C) 15 D) 20 E) 25

12. $8 + 10 + 12 + \ldots + 88 = A$

$5 + 7 + 9 + \ldots + 89 = B$

$\Rightarrow 1 + 2 + 3 + \ldots + 87 + 88 + 89 = ?$

A) A + B - 16 B) A + B - 13 C) A + B D) A + B + 13 E) A + B + 16

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9. $A = 1 + 2 + 3 + \ldots + n$

$B = 10 + 11 + 12 + \ldots + n - 1$

$A - B = 90 \Rightarrow$ **n = ?**

A) 41 B) 42 C) 43 D) 44 E) 45

10. $A = 1 + 2 + 3 + \ldots + n - 2$

$B = 15 + 16 + \ldots + n$

$A - B = 42 \Rightarrow$ **n = ?**

A) 30 B) 31 C) 32 D) 33 E) 34

11. $A = 1 + 2 + 3 + \ldots + n - 1$

$B = 11 + 12 + \ldots + n$

$A - B = 5 \Rightarrow$ **n = ?**

A) 30 B) 40 C) 50 D) 60 E) 70

12. $A = 4 + 6 + 8 + \ldots + n$

$B = 8 + 10 + 12 + \ldots n$

$A + B = 330 \Rightarrow$ **B = ?**

A) 155 B) 160 C) 165 D) 170 E) 175

13. $A = 1{\cdot}2 + 2{\cdot}4 + 3{\cdot}6 + \ldots + 14{\cdot}28$

$B = 1{\cdot}3 + 2{\cdot}5 + 3{\cdot}7 + \ldots + 14{\cdot}29$

$\Rightarrow$ **B = ?**

A) A – 5 B) A + 25 C) A + 45 D) A + 90 E) A + 105

14. $A = 1{\cdot}2 + 2{\cdot}4 + 3{\cdot}6 + 4{\cdot}8 + \ldots + 12{\cdot}24$

$B = 1{\cdot}3 + 2{\cdot}5 + 3{\cdot}7 + 4{\cdot}9 + \ldots + 12{\cdot}25$

$\Rightarrow$ **B = ?**

A) A + 10 B) A + 12 C) A + 14 D) A + 16 E) A + 78

15. $A = 1{\cdot}2 + 2{\cdot}4 + 3{\cdot}6 + \ldots + 10{\cdot}20$

$B = 1{\cdot}3 + 2{\cdot}5 + 3{\cdot}7 + \ldots + 10{\cdot}21$

$\Rightarrow$ **B = ?**

A) 50 – A B) 55 + A C) 60 – A D) 50 + A E) 40 + A

16. $x = 1{\cdot}2{\cdot}3 + 2{\cdot}3{\cdot}4 + \ldots + 14{\cdot}15{\cdot}16$

$\Rightarrow$ **$4{\cdot}6{\cdot}8 + 6{\cdot}8{\cdot}10 + \ldots + 28{\cdot}30{\cdot}32 = ?$**

A) x – 6 B) x + 4 C) 4x – 32 D) 8x – 48 E) 8x

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	E	D	E	E	C	C	E
9	10	11	12	13	14	15	16
E	C	C	B	E	E	B	D

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1. **a ve b aralarında asal sayılardır.**

a and b are relatively primes.

$\frac{a+2b}{a-b}=\frac{4}{3} \Rightarrow$ **a + b = ?**

A) 9 B) 10 C) 11 D) 12 E) 13

2. $x, y, z \in N^+$

$1800 = 2^x.3^y.5^z$

$\Rightarrow$ **x + y + z = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

3. $x, y, z \in N^+$

$150 = 2^x.3^y.5^z$

$\Rightarrow$ **x + y − 5z = ?**

A) 0 B) 3 C) −4 D) −8 E) −12

4. $360 = 2^x.3^y.5^z \Rightarrow$ **x·y·z = ?**

A) 4 B) 6 C) 8 D) 9 E) 12

5. $a, b, c \in Z^+$,

$660 = k \cdot 2^a \cdot 3^b \Rightarrow$ **min(k) = ?**

A) 30 B) 44 C) 55 D) 60 E) 66

6. $a, z \in N^+$,

$a \cdot 150 = z^2 \Rightarrow$ **min(a) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

7. $x, y \in N^+$

$24 \cdot x = y^3 \Rightarrow$ **min(x + y) = ?**

A) 12 B) 14 C) 15 D) 17 E) 18

8. $A, B \in N^+$

$40 \cdot A = B^3 \Rightarrow$ **min(A + B) = ?**

A) 15 B) 20 C) 25 D) 30 E) 35

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9. $A, B \in N^+$,
$75.A = B^3$
$\Rightarrow$ **min(A) = ?**

A) 30 B) 40 C) 45 D) 50 E) 75

10. $x, y \in Z^+$,
$144 \cdot x = y^3 \Rightarrow$ **min(x + y) = ?**

A) 16 B) 18 C) 20 D) 22 E) 24

11. $x, y \in Z^+$,
$72 \cdot x = y^4 \Rightarrow$ **min(x + y) = ?**

A) 21 B) 22 C) 23 D) 24 E) 25

12. $x, y \in N^+$,
$60 \cdot x^2 = y^3 \Rightarrow$ **min(x + y) = ?**

A) 120 B) 136 C) 142 D) 156 E) 172

13. 180 sayısının tam sayı bölenlerinin sayısı kaçtır?
What is the number of integer divisors of 180?

A) 18 B) 26 C) 32 D) 36 E) 38

14. $A = 2^n \cdot 3^2 \cdot 10$ sayısının pozitif tam sayı bölenlerinin sayısı 42 ise n kaçtır?
If the number of positive integer divisors of $A = 2^n \cdot 3^2 \cdot 10$ is 42, what is n?

A) 4 B) 5 C) 6 D) 7 E) 8

15. $A = 3 \cdot 20^n$ sayısının tam sayı bölenlerinin sayısı 180 ise A sayısı kaç basamaklıdır?
If the number of integer divisors of $A = 3 \cdot 20^n$ is 180, how many digits is A number?

A) 2 B) 3 C) 4 D) 5 E) 6

16. 1 < n < 50 olmak üzere pozitif bölenlerinin sayısı 3 olan kaç tane n tam sayısı vardır?
If 1< n < 50, how many integer numbers are there in a way that the number of its positive integer divisors are 3?

A) 2 B) 3 C) 4 D) 5 E) 7

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1	2	3	4	5	6	7	8
C	D	D	B	C	E	C	E
9	10	11	12	13	14	15	16
C	E	D	A	D	B	E	C

1. $13! = x \cdot 12! \Rightarrow$ **x = ?**

A) 13 B) 12 C) 11 D) 10 E) 9

2. $21! = a \cdot 20! \Rightarrow$ **a = ?**

A) 20 B) 21 C) 22 D) 23 E) 24

3. $\dfrac{2! + 3! + 4!}{5!} = ?$

A) $\frac{1}{15}$ B) $\frac{2}{15}$ C) $\frac{1}{5}$ D) $\frac{4}{15}$ E) $\frac{1}{3}$

4. $\dfrac{10! + 9!}{8!} = ?$

A) 17 B) 72 C) 80 D) 90 E) 99

5. $\dfrac{4! + 5! + 6!}{4! + 5!} = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

6. $\dfrac{5! + 6!}{5!} = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

7. $\dfrac{8! + 9!}{9!} = ?$

A) 1 B) $\frac{9}{8}$ C) $\frac{10}{9}$ D) $\frac{8}{9}$ E) $\frac{9}{10}$

8. $n \in N$

$\dfrac{12! + 11! + 10!}{12! - 11!} = \dfrac{n^2}{121} \Rightarrow$ **n = ?**

A) 6 B) 8 C) 10 D) 12 E) 14

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9. $42 \cdot 5! = n(n-1)! \Rightarrow$ **n = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

10. $7! \cdot x + 8! \cdot x = 10! \Rightarrow$ **x = ?**

A) 80 B) 72 C) 63 D) 54 E) 45

11. $\frac{n!}{7!} = 72 \Rightarrow$ **n = ?**

A) 8 B) 9 C) 10 D) 11 E) 12

12. $\frac{(x-2)!}{9!} = 110 \Rightarrow$ **x = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

13. $\frac{(n-2)!}{(n-3)!} = 10 \Rightarrow$ **n = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

14. $\frac{(n+1)!}{(n-1)!} = 72 \Rightarrow$ **n = ?**

A) 10 B) 9 C) 8 D) 7 E) 6

15. $\frac{(n-1)!}{(n-2)!} + \frac{(n+3)!}{(n+2)!} = 18 \Rightarrow$ **n = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

16. $\frac{n!}{(n-1)!} + \frac{(n-1)!}{(n-2)!} + \frac{(n-2)!}{(n-3)!} = 30 \Rightarrow$ **n = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	B	D	E	C	D	C	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	A	B	D	C	C	D	B

1. $\dfrac{(n-1)!}{(n-2)!}+\dfrac{(n+2)!}{(n+1)!}+\dfrac{n!}{(n-1)!}=61$

$\Rightarrow$ **n = ?**

A) 16 B) 19 C) 20 D) 21 E) 25

2. $\dfrac{(2n-1)!}{(2n-2)!}\cdot\dfrac{(n-1)!}{n!}=\dfrac{11}{6} \Rightarrow$ **n = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

3. $\dfrac{a!\cdot(2a+1)!}{(a-1)!\cdot(2a+2)!}=\dfrac{4}{9} \Rightarrow$ **a = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

4. $\dfrac{(n-3)!}{(n-4)!}\cdot\dfrac{(n+3)!}{(n+2)!}=16 \Rightarrow \mathbf{\dfrac{n!}{4!}=?}$

A) 4 B) 5 C) 6 D) 7 E) 8

5. $\dfrac{(n+1)!}{n\cdot(n-2)!}=15 \Rightarrow$ **n = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

6. $\dfrac{(n-2)!+(n-1)!+n!}{(n-2)!}=64 \Rightarrow$ **n = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

7. $\mathbf{\dfrac{(n-3)!-2(n-5)!}{(n-4)!-(n-5)!}=?}$

A) n − 1 B) n − 2 C) n − 3 D) n − 4 E) n − 5

8. $\mathbf{\dfrac{(n+2)!+(n+1)!}{n!+(n+2)\cdot n!}=?}$

A) n B) n + 1 C) n + 2 D) n + 3 E) n + 4

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9. $n!+(n+1)!=\frac{(n+2)!}{6} \Rightarrow$ **n = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

10. **(4 – a)! + (a + 1)! + (a – 4)! = ?**

A) 118 B) 120 C) 122 D) 124 E) 126

11. $A=\frac{(n-4)!+n!}{(4-n)!+4} \Rightarrow$ **A = ?**

A) 1 B) 5 C) 12 D) 24 E) 25

12. $a, b \in N$,

$\frac{a!}{b!}=720 \Rightarrow$ **max(a + b) = ?**

A) 6 B) 7 C) 720 D) 721 E) 1439

13. $a, b \in N$,

$\frac{a!}{b!}=120 \Rightarrow$ **min(a + b) + max(a + b) = ?**

A) 5 B) 11 C) 15 D) 120 E) 244

14. $n, m \in N, n > 1$

$\frac{(n-1)!}{m!}=120 \Rightarrow$ **min(n + m) = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

15. $\frac{a!}{b!}=12 \Rightarrow$ **min(a + b) = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

16. $x, y \in N$,

$\frac{x!}{y!}=6 \Rightarrow$ **$\sum$(x + y) = ?**

A) 10 B) 12 C) 14 D) 16 E) 18

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	C	D	B	B	C	B	B
9	10	11	12	13	14	15	16
A	C	B	E	E	A	D	E

1. $n, A \in \mathbb{N}$,

$42! = A \cdot 10^n \Rightarrow$ **max(n) = ?**

A) 9 B) 16 C) 17 D) 21 E) 27

2. $A, n \in \mathbb{N}$,

$38! = A \cdot 10^n \Rightarrow$ **max(n) = ?**

A) 7 B) 8 C) 9 D) 10 E) 11

3. $n, A \in \mathbb{N}$,

$120! = A \cdot 10^n \Rightarrow$ **max(n) = ?**

A) 30 B) 29 C) 28 D) 27 E) 26

4. $n, A \in \mathbb{N}$,

$48! = A \cdot 5^n \Rightarrow$ **max(n) = ?**

A) 7 B) 8 C) 9 D) 10 E) 11

5. $n, A \in \mathbb{N}$,

$34! = A \cdot 3^n \Rightarrow$ **max(n) = ?**

A) 11 B) 12 C) 13 D) 14 E) 15

6. $n, A \in \mathbb{N}$,

$49! = A \cdot 7^n \Rightarrow$ **max(n) = ?**

A) 7 B) 8 C) 9 D) 10 E) 11

7. $A, x, y, z \in \mathbb{N}$,

$12! = 5^x \cdot 7^y \cdot 11^z \cdot A \Rightarrow$ **max(x + y + z) = ?**

A) 4 B) 6 C) 8 D) 10 E) 12V

8. $a, b, c \in \mathbb{N}$,

$\frac{35!}{5^a \cdot 7^b} = c \Rightarrow$ **max(a + b) = ?**

A) 13 B) 14 C) 15 D) 16 E) 17

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9. A, n ∈ N,

27! = A·6^n ⇒ **max(n) = ?**

A) 9 B) 10 C) 11 D) 12 E) 13

10. A, n ∈ N,

38! = 21^n · A ⇒ **max(n) = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

11. x, y ,z ∈ N,

11! = $2^x \cdot 3^y \cdot 5^z \cdot m$

⇒ **min(m) = ?**

A) 44 B) 55 C) 66 D) 77 E) 88

12. n, A ∈ N,

30! = A·9^n ⇒ **max(n) = ?**

A) 14 B) 12 C) 9 D) 7 E) 6

13. A, n ∈ N,

43! = A·4^n ⇒ **max(n) = ?**

A) 19 B) 24 C) 30 D) 33 E) 39

14. n, A ∈ N,

17! = A·4^n ⇒ **$\sum n$ = ?**

A) 20 B) 22 C) 24 D) 26 E) 28

15. n, A ∈ N,

20! = A·8^n ⇒ **max(n) = ?**

A) 10 B) 9 C) 8 D) 7 E) 6

16. n, A ∈ N,

29! = A·12^n ⇒ **max(n) = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	B	C	D	E	B	A	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
E	A	D	D	A	E	E	D

1. $n, A \in \mathbb{N}$,

$15! + 25! = A \cdot 10^n \Rightarrow$ **max(n) = ?**

A) 3 B) 5 C) 6 D) 9 E) 10

2. $n, A \in \mathbb{N}^+$,

$35! + 36! = A \cdot 10^n \Rightarrow \sum n = ?$

A) 34 B) 35 C) 36 D) 37 E) 38

3. $n, A \in \mathbb{N}^+$,

$38! + 39! = A \cdot 10^n \Rightarrow$ **max(n) = ?**

A) 8 B) 9 C) 10 D) 11 E) 12

4. $A, n \in \mathbb{N}$,

$48! + 49! = A \cdot 10^n \Rightarrow$ **max(n) = ?**

A) 8 B) 12 C) 14 D) 16 E) 20

5. $40! - 1 = \ldots\ldots\underbrace{999\ldots9}_{\text{n tane / n times}} \Rightarrow$ **n = ?**

A) 10 B) 9 C) 8 D) 7 E) 6

6. $51! - 3 = \ldots\ldots\underbrace{999\ldots9}_{\text{n tane / n times}}7 \Rightarrow$ **n = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

7. $A = 50!$

$A - 2357 = \ldots abcd$

$\Rightarrow$ **a + b + c + d = ?**

A) 14 B) 16 C) 18 D) 20 E) 22

8. $1! + 2! + 3! + \ldots + 28! = \ldots x \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 7

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9. A = 1! + 2! + 3! + ... + 19!

$\begin{array}{r|l} A & B \\ \cline{2-2} - & 5 \\ \hline 1 & \end{array}$ $\quad \begin{array}{r|l} B & 3 \\ \cline{2-2} - & \\ \hline 2 & \end{array}$ $\quad \begin{array}{r|l} A & 15 \\ \cline{2-2} - & \\ \hline k & \end{array}$

$\Rightarrow$ **k = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

10. A = 1! + 2! + 3! + ... + 48!

$\begin{array}{r|l} A & 6 \\ \cline{2-2} - & \\ \hline x & \end{array}$ $\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

11. A = 1! + 2! + 3! +... + 25!

$\begin{array}{r|l} A & 12 \\ \cline{2-2} - & \\ \hline k & \end{array}$ $\Rightarrow$ **k = ?**

A) 7 B) 8 C) 9 D) 10 E) 11

12. $\begin{array}{r|l} 8! + 9! & 7! \\ \cline{2-2} - & \\ \hline ? & \end{array}$

A) 0 B) 1 C) 2 D) 3 E) 4

13. A = 60!

$\begin{array}{r|l} A & 40 \\ \cline{2-2} - & \\ \hline ? & \end{array}$

A) 0 B) 20 C) 30 D) 35 E) 39

14. A = 72!

$\begin{array}{r|l} A & 108 \\ \cline{2-2} - & \\ \hline ? & \end{array}$

A) 0 B) 18 C) 36 D) 72 E) 107

15. A = 6! + 7! + 8!

A sayısının kaç tane asal çarpanı vardır.

A) 2 B) 3 C) 4 D) 5 E) 6

16. $A = \dfrac{22!}{4^x}$

A sayısı bir çift tamsayı ise x in alabileceği en büyük tamsayı değeri kaçtır?

A) 9 B) 12 C) 15 D) 18 E) 21

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	C	B	B	B	B	D	D
9	10	11	12	13	14	15	16
D	D	C	A	A	A	B	A

1. $\begin{array}{r|l} 238 & 17 \\ - & x \\ y & \end{array} \Rightarrow$ **x − y = ?**

A) 17 B) 16 C) 15 D) 14 E) 13

2. $\begin{array}{r|l} 32132132 & 321 \\ - & x \\ y & \end{array} \Rightarrow$ **x + y = ?**

A) 100000 B) 100010 C) 100001 D) 100100 E) 100132

3. $\begin{array}{r|l} A & 12 \\ - & 3 \\ 5 & \end{array} \Rightarrow$ **A = ?**

A) 36 B) 37 C) 39 D) 41 E) 43

4. $\begin{array}{r|l} A & B \\ - & 10 \\ 9 & \end{array}$

A + B = 130 ⇒ **B = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

5. $\begin{array}{r|l} A & B \\ - & 5 \\ 2 & \end{array} \quad \begin{array}{r|l} B & 6 \\ - & 3 \\ 2 & \end{array} \quad \begin{array}{r|l} A & 30 \\ - & \\ ? & \end{array}$

A) 10 B) 11 C) 12 D) 13 E) 14

6. $\begin{array}{r|l} A & B \\ - & 6 \\ 4 & \end{array} \quad \begin{array}{r|l} A+2 & B-1 \\ - & 8 \\ 2 & \end{array} \Rightarrow$ **A = ?**

A) 34 B) 35 C) 36 D) 37 E) 40

7. $\begin{array}{r|l} A & 6 \\ - & B \\ 0 & \end{array} \quad \begin{array}{r|l} B & 12 \\ - & 3 \\ 0 & \end{array} \Rightarrow$ **A = ?**

A) 208 B) 216 C) 244 D) 274 E) 198

8. $\begin{array}{r|l} A & 11 \\ - & 7 \\ C & \end{array} \Rightarrow$ **max(A) = ?**

A) 87 B) 85 C) 83 D) 81 E) 79

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9. $\begin{array}{r|l} A & B \\ \cline{2-2} - & 14 \\ \hline 5 & \end{array} \Rightarrow \mathbf{min(A) = ?}$

A) 83 B) 89 C) 91 D) 95 E) 101

10. $B \in N$,

$\begin{array}{r|l} A & B \\ \cline{2-2} - & 11 \\ \hline 9 & \end{array} \quad \begin{array}{r|l} C & 11 \\ \cline{2-2} - & 4 \\ \hline B & \end{array} \Rightarrow \mathbf{A - C = ?}$

A) 61 B) 62 C) 63 D) 64 E) 65

11. $k \in N$,

$\begin{array}{r|l} A & 39 \\ \cline{2-2} - & 2 \\ \hline k^2 & \end{array} \Rightarrow \mathbf{max(A) = ?}$

A) 110 B) 114 C) 120 D) 130 E) 132

12. $A = 10^4.(8763).(9364)$

$\Rightarrow \begin{array}{r|l} A & 30 \\ \cline{2-2} - & \\ \hline ? & \end{array}$

A) 0 B) 1 C) 2 D) 5 E) 7

13. $\begin{array}{r|l} A & 33 \\ \cline{2-2} - & 4 \\ \hline x^2 & \end{array} \Rightarrow \mathbf{max(A) = ?}$

A) 160 B) 162 C) 164 D) 166 E) 168

14. $\begin{array}{r|l} A & 30 \\ \cline{2-2} - & x \\ \hline x^2 & \end{array} \Rightarrow \mathbf{max(A) = ?}$

A) 170 B) 175 C) 180 D) 185 E) 190

15. $\begin{array}{r|l} A & x \\ \cline{2-2} - & 7 \\ \hline 3 & \end{array} \quad \begin{array}{r|l} x & y \\ \cline{2-2} - & 5 \\ \hline 2 & \end{array} \Rightarrow \begin{array}{r|l} A & 35 \\ \cline{2-2} - & \\ \hline ? & \end{array}$

A) 5 B) 6 C) 12 D) 17 E) 23

16. $\begin{array}{r|l} A & 6 \\ \cline{2-2} - & x \\ \hline 2 & \end{array} \quad \begin{array}{r|l} x & y \\ \cline{2-2} - & 4 \\ \hline 1 & \end{array} \Rightarrow \begin{array}{r|l} A & 12 \\ \cline{2-2} - & \\ \hline ? & \end{array}$

A) 4 B) 6 C) 7 D) 8 E) 9

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	E	D	B	C	E	B	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	E	B	A	C	B	D	D

1. $\begin{array}{r|l} 534a & 2 \\ \hline - \; 1 & \end{array} \Rightarrow \sum a = ?$

A) 1 B) 7 C) 15 D) 19 E) 25

2. $\begin{array}{r|l} 462x & 3 \\ \hline - \; 0 & \end{array} \Rightarrow \max(x) = ?$

A) 9 B) 8 C) 7 D) 6 E) 5

3. $\begin{array}{r|l} 2615x & 3 \\ \hline - \; 2 & \end{array} \Rightarrow \sum x = ?$

A) 9 B) 10 C) 11 D) 12 E) 13

4. $\begin{array}{r|l} 26a2 & 4 \\ \hline - \; 0 & \end{array} \Rightarrow \sum a = ?$

A) 25 B) 22 C) 19 D) 16 E) 13

5. $\begin{array}{r|l} 37x5y & 5 \\ \hline - \; 2 & \end{array} \quad \begin{array}{r|l} 37x5y & 3 \\ \hline - \; 0 & \end{array} \Rightarrow \max(x) = ?$

A) 5 B) 6 C) 7 D) 8 E) 9

6. $\begin{array}{r|l} 456x & 6 \\ \hline - \; 0 & \end{array} \Rightarrow x = ?$

A) 2 B) 4 C) 5 D) 6 E) 8

7. $\begin{array}{r|l} 2734x & 9 \\ \hline - \; 2 & \end{array} \Rightarrow x = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

8. $A = (3412)^9 \cdot (254)^3$

$\Rightarrow \begin{array}{r|l} A & 9 \\ \hline - \; ? & \end{array}$

A) 4 B) 5 C) 6 D) 7 E) 8

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9. $\begin{array}{r|l} ab4 & 9 \\ \hline - & 2x \\ 5 & \end{array} \Rightarrow \begin{array}{r|l} \mathbf{76a8b} & \mathbf{9} \\ \hline - & \\ \mathbf{?} & \end{array}$

A) 1 B) 4 C) 6 D) 7 E) 8

10. $\begin{array}{r|l} 4x57y & 15 \\ \hline - & \\ 0 & \end{array} \Rightarrow \mathbf{max(x) = ?}$

A) 5 B) 6 C) 7 D) 8 E) 9

11. $\begin{array}{r|l} 9ABB & 45 \\ \hline - & \\ 0 & \end{array} \Rightarrow \mathbf{\sum A = ?}$

A) 19 B) 18 C) 17 D) 16 E) 15

12. $x \in Z,$

$\begin{array}{r|l} A & 27 \\ \hline - & 2 \\ x^2 & \end{array} \Rightarrow \mathbf{max(A) = ?}$

A) 76 B) 77 C) 78 D) 79 E) 80

13. $\begin{array}{r|l} 5a4b & 30 \\ \hline - & \\ 3 & \end{array} \Rightarrow \mathbf{max(a + b) = ?}$

A) 7 B) 8 C) 10 D) 11 E) 12

14. $A = 48527134$

$\Rightarrow \begin{array}{r|l} \mathbf{A} & \mathbf{11} \\ \hline - & \\ \mathbf{?} & \end{array}$

A) 1 B) 4 C) 6 D) 7 E) 10

15. **9 basamaklı AAAA4675B sayısının 5 ile bölümünden kalan 3 tür. Bu sayı, 6 ile tam bölünebildiğine göre, A kaç farklı değer alabilir?**

When the nine-digit number AAAA4675B is divided by 5, the remainder is 3. If this number is divisible by 6, how many different values can A get?

A) 2 B) 3 C) 5 D) 6 E) 7

16. $A = (43251764)$

$\Rightarrow \begin{array}{r|l} \mathbf{A} & \mathbf{8} \\ \hline - & \\ \mathbf{?} & \end{array}$

A) 0 B) 2 C) 3 D) 4 E) 6

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	A	D	A	D	D	C	E
9	10	11	12	13	14	15	16
B	E	C	D	E	D	B	D

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1. **OBEB / GCF (80, 180) = ?**

A) 5 B) 10 C) 20 D) 40 E) 8680

2. **OKEK / LCM (16, 24, 30) = ?**

A) 240 B) 220 C) 200 D) 180 E) 160

3. $A = 2^3.3^4.5^2$

$B = 2^4.3^2.11$

$\Rightarrow$ **OBEB / GCF (A, B) = ?**

A) 64 B) 68 C) 72 D) 88 E) 96

4. $a, b \in Z^+$

$2a = 5b$

OBEB / GCF (a, b) = 6

$\Rightarrow$ **min(a + b) = ?**

A) 40 B) 42 C) 44 D) 46 E) 48

5. $x, y \in N^+$

$x + y = 44$

$\Rightarrow$ **max($(x, y)_{OKEK\ /\ LCM}$) = ?**

A) 480 B) 481 C) 482 D) 483 E) 484

6. $a, b \in N$

OKEK / LCM (12, 9) = 12a + 9b $\Rightarrow$ **min(a + b) = ?**

A) 3 B) 5 C) 7 D) 9 E) 11

7. OKEK / LCM (A, B) = 60 $\Rightarrow$ **max(A + B) = ?**

A) 108 B) 120 C) 124 D) 130 E) 132

8. OKEK / LCM (A, B) = 18 $\Rightarrow$ **min(A + B) = ?**

A) 5 B) 7 C) 9 D) 11 E) 13

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. OKEK / LCM (A, B, C) = 30, $A \neq B \neq C$

$\Rightarrow$ **max(A + B + C) = ?**

A) 35 B) 44 C) 45 D) 48 E) 55

10. $A, B \in N$

4A = 9B

OBEB / GCF (A, B) = 3 $\Rightarrow$ **min(A + B) = ?**

A) 37 B) 39 C) 41 D) 43 E) 45

11. OBEB$(x, x^2) = 4$ $\Rightarrow$ **OKEK / GCF $(x + 2, 2\sqrt{x} + 5)$ = ?**

A) 18 B) 24 C) 36 D) 48 E) 54

12. $x, y, z \in Z^+$,

A = 3x + 2 = 5y + 2 = 9z + 2 $\Rightarrow$ **min(A) = ?**

A) 43 B) 45 C) 47 D) 59 E) 51

13. A = 5a + 2 = 6b + 3 = 7c + 4

$\Rightarrow$ **min(A) = ?**

A) 203 B) 205 C) 207 D) 209 E) 211

14. **120 metre ve 96 metre uzunluğundaki iki top kumaş eşit uzunlukta en büyük parçalara ayrılıyor.**

Buna göre toplam kaç parça kumaş elde edilir?

Two ball fabric rolls with lengthes of 120 meters and 96 meters are divided into the largest pieces in equal length. Accordingly how many pieces of fabrics are obtained?

A) 9 B) 10 C) 11 D) 12 E) 13

15. **Kenar uzunlukları 49 cm ve 63 cm olan bir dikdörtgen kenar uzunlukları tamsayı olan en az kaç tane eş alanlı kareye ayrılabilir?**

What is the smallest number of equal squares which we can make from a rectangle with the width of 49 cm and the length of 63 cm?

A) 59 B) 60 C) 61 D) 62 E) 63

16. **Boyutları 144 cm, 192 cm ve 216 cm olan dikdörtgenler prizması eşit hacimli küplere ayrılacaktır.**

Buna göre en az kaç küp oluşur?

The rectangular prism with dimensions of 144 cm, 192 cm and 216 cm will be divided into cubes of equal volume. Accordingly at least how many cubes are formed?

A) 430 B) 432 C) 436 D) 440 E) 444

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	A	C	B	D	A	B	D
9	10	11	12	13	14	15	16
E	B	A	C	C	A	E	B

1. $20 - 2 \cdot [72 : (24 : 8 + 5) - 1] = ?$

A) –6 B) –4 C) 4 D) 6 E) 8

2. $x \in Z^-$, $y \in N^+$

$\Rightarrow$ **min(5y – 6x) = ?**

A) –13 B) –11 C) –6 D) 11 E) 13

3. $1 + 3 + 5 + 7 + ... + (2x - 7) = 400 \Rightarrow$ **x = ?**

A) 22 B) 23 C) 24 D) 25 E) 27

4. $x, y \in N^+$

$(x + 2)(y - 1) = 13 \Rightarrow$ **x – y = ?**

A) 9 B) 12 C) 15 D) 18 E) 20

5. $x \in Z$

$(x^5 + x^4 + x) = M$, **M çift sayı ise aşağıdakilerden hangisi tek sayıdır?**

If M is even, which one of the followings is odd?

A) x^5 B) $x^4 + x$ C) $x^5 - x$ D) $x^5 + x + 1$ E) $x^5 + x + 2$

6. ABB, BAA $\in$ N

ABB – BAA = 445 $\Rightarrow$ **max(A + B) = ?**

A) 11 B) 12 C) 13 D) 14 E) 15

7. AB, BC, CA $\in$ N

$\frac{AB + BC + CA}{3} = 55 \Rightarrow$ $\frac{\mathbf{A + B + C}}{\mathbf{3}}$ **= ?**

A) 4 B) 5 C) 6 D) 7 E) 8

8. $A, B, C \in N^+$

$$\begin{array}{r|l} A & B \\ \hline - & 3 \\ 2 & \end{array} \qquad \begin{array}{r|l} B & C \\ \hline - & 4 \\ 5 & \end{array} \Rightarrow \mathbf{C = ?}$$

A) $\frac{A-17}{12}$ B) $\frac{A-12}{17}$ C) $\frac{A}{17}$ D) $\frac{A+17}{2}$ E) $\frac{A}{12}$

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9. $74A5B \in N$

$$\begin{array}{r|l} 74A5B & 12 \\ \underline{-\quad\quad} & \\ 0 & \end{array} \Rightarrow \max(A+B) = ?$$

A) 11 B) 13 C) 14 D) 15 E) 17

10. $\dfrac{10! + 11!}{8! + 9!} = ?$

A) 108 B) 110 C) 112 D) 120 E) 124

11. $x, A \in N^+$

$26! = 6^x \cdot A \Rightarrow \max(x) = ?$

A) 7 B) 8 C) 9 D) 10 E) 11

12. OKEK / LCM $(x + 3, x + 5) = 180$

OBEB / GCF $(x + 3, x + 5) = 2 \Rightarrow x = ?$

A) 12 B) 15 C) 18 D) 21 E) 24

13. $AB \in N$, $CD \in N$

$AB = x$, $CD = y$

OBEB / GCF $(x,y) = 15 \Rightarrow \max(x + y) = ?$

A) 124 B) 130 C) 144 D) 150 E) 165

14. $\dfrac{(n+1)!}{n!} + 3! = 43 \Rightarrow n = ?$

A) 30 B) 32 C) 36 D) 37 E) 38

15. $\begin{array}{r|l} A & B \\ \underline{-\quad} & C \\ 8 & \end{array} \quad \begin{array}{r|l} A+4 & B+1 \\ \underline{-\quad\quad} & C-1 \\ 13 & \end{array} \Rightarrow \dfrac{B}{C} = ?$

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 1 D) 2 E) 3

16. $AAB \in N$, $BA \in N$

$$\begin{array}{r} AAB \\ BA \\ \underline{+\quad\quad} \\ 388 \end{array} \Rightarrow B - A = ?$$

A) 1 B) 2 C) 3 D) 4 E) 5

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	D	B	A	D	C	B	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	A	D	B	E	C	C	B

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1. a, b, c ardışık tek sayılar ve a < b < c dir.

a, b and c are consecutive odd numbers and a < b < c.

$$\frac{(c-a)\cdot(a-b)}{2c-2b} = ?$$

A) –2 B) 0 C) 2 D) 4 E) 6

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

2. $\frac{5}{3}+\frac{10}{3}+\frac{15}{3}+\ldots+\frac{55}{3} = ?$

A) 115 B) 110 C) 90 D) $\frac{260}{3}$ E) $\frac{285}{3}$

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

3.

$$\begin{array}{r} a\,b\,c \\ \times \quad 2\,d \\ \hline \bullet\,\bullet\,\bullet\,\bullet \\ 7\,1\,4 \\ + \qquad \\ \hline 9\,9\,9\,6 \end{array} \Rightarrow a+b+c+d = ?$$

A) 33 B) 29 C) 25 D) 23 E) 19

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

4. A, B, C birer rakam ve / A, B, C each a digit and as

$$\begin{array}{r} ABC \\ -\ ACB \\ \hline 72 \end{array} \Rightarrow B - C = ?$$

A) 8 B) 12 C) 13 D) 14 E) 15

[FIRAT ÜNİVERSİTESİ – YÖS 2018]

5. Aşağdakilerden hangisi tek sayıdır?

Which one of the followings is an odd number?

A) $2^{40} + 7!$ B) $63! - 3^{10}$ C) $0! + 5^{20}$ D) $4^7\cdot3^5 - 8^{14}$ E) $11! - 9!$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

6. $\frac{2}{3}, \frac{7}{9}, \frac{4}{13}$ **sayılarına kalansız bölünen üç basamaklı en küçük sayı kaçtır?**

What is the mallest 3 digit number divisible by numbers $\frac{2}{3}, \frac{7}{9}$ and $\frac{4}{13}$?

A) 102 B) 108 C) 112 D) 120 E) 124

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

7. A, x, y, z $\in Z^+$

A = 4x + 1 = 5y + 1 = 7z + 1 ⇒ **min(A) = ?**

A) 120 B) 141 C) 156 D) 173 E) 280

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

8.

$$\begin{array}{r} A\ B\ C \\ A\ C\ B \\ +\ A\ C\ A \\ \hline 7\ 7\ A \end{array} \Rightarrow AxBxC = ?$$

A) 56 B) 48 C) 40 D) 36 E) 24

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $a, b \in Z^+$

$a + \frac{b}{4} = 3,5 \Rightarrow$ **max(a) = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

10.

$$\begin{array}{r} AAB \\ \times \quad BA \\ \hline \bullet\bullet\bullet \\ +\,1356 \\ \hline \bullet\bullet\bullet\bullet\bullet \end{array} \Rightarrow \textbf{A = ?}$$

A) 1 B) 2 C) 3 D) 4 E) 5

[ATATÜRK ÜNİVERSİTESİ – YÖS 2017]

11. $ABC \in N, \quad AB \in N$

$ABC - AB = 353 \Rightarrow$ **A + B + C = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

12.

$$\begin{array}{r|l} A & 5 \\ \cline{2-2} - & B \\ \hline 2 & \end{array} \quad , \quad \begin{array}{r|l} A+9 & B+2 \\ \cline{2-2} - & 5 \\ \hline x & \end{array} \Rightarrow \textbf{x = ?}$$

A) 1 B) 2 C) 3 D) 4 E) 5

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

13. $a, b, c \in Z$

$a^3 \cdot b^2 < 0$

$b^3 \cdot c^3 > 0$

$c^5 \cdot a^4 < 0$

a, b, c'nin işareti sırayla hangisidir?

What are the signs of a, b, c respectively?

A) –,–,– B) –,–,+ C) +,+,+ D) +,+,– E) +,–,–

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

14. $a, b, c \in N^+$

$\left.\begin{array}{l} a \cdot b = 30 \\ b \cdot c = 42 \end{array}\right\} \Rightarrow$ **min(a + b + c) = ?**

A) 78 B) 38 C) 27 D) 20 E) 18

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

15. $a, b \in N$

$\frac{a,b}{ab} + \frac{ab}{0,ab} = ?$

A) 1,01 B) 10,01 C) 100,1 D) 101 E) 101,01

[BALIKESİR ÜNİVERSİTESİ – YÖS 2017]

16. $x, y, z \in Z^+$

$\left.\begin{array}{l} x + y = 30 \\ x \cdot z = 48 \end{array}\right\} \Rightarrow$ **min(y + z) = ?**

A) 4 B) 8 C) 15 D) 19 E) 21

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	B	D	A	B	C	B	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
A	B	E	A	A	E	C	B

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BÖLÜM
CHAPTER 2

TARİHSEL NOT / HISTORICAL NOTE

Ali Kuşçu [1403 – 1474]

Ali Kuşçu asıl adı Ali Bin Muhammed Türk gökbilimci, matematikçi ve dilbilimcidir. Küçük yaştan itibaren matematik ve astronomiye ilgi duyan Ali Kuşçu, Uluğ Bey'in oğlu ve Bursalı Kadızade Rumi'nin öğrencisidir.

Ali Kuşçu, with real name of Ali bin Muhammed, was a Turkish astronomer, mathematician and physicist. He, son of Ulug and student of Qazizadeh, was interested to mathematics and astronomy from early ages.

RASYONEL ve ONDALIK SAYILAR
RATIONAL and DECIMAL NUMBERS

Bu bölüm 128 alıştırma sorusu, 240 test sorusu, 16 YÖS sorusu içermektedir.

This chapter includes 128 exercise questions, 240 test questions, and 16 YÖS questions.

BÖLÜM / CHAPTER 2

RASYONEL SAYILAR / RATIONAL NUMBERS

- Rasyonel Sayılar / Rational Numbers . . . . 71 - 120

RASYONEL VE ONDALIK SAYILAR
RATIONAL AND DECIMAL NUMBERS

1. $\frac{1}{6}-\frac{1}{3}+\frac{1}{2}=?$

Yanıt / The Answer is $\frac{1}{3}$

2. $\frac{3}{4}+2-\frac{1}{2}=?$

Yanıt / The Answer is $\frac{9}{4}$

3. $\frac{5}{12}-\left(\frac{2}{3}-\frac{1}{4}\right)=?$

Yanıt / The Answer is 0

4. $\left(2+\frac{3}{4}\right)-\left(3-\frac{1}{2}\right)=?$

Yanıt / The Answer is $\frac{1}{4}$

5. $\left(3-\frac{5}{6}\right)-\left(2-\frac{1}{9}\right)=?$

Yanıt / The Answer is $\frac{5}{18}$

6. $1+\frac{1}{2}-\left(\frac{1}{3}-\frac{1}{4}\right)=?$

Yanıt / The Answer is $\frac{17}{12}$

7. $\left(1+\frac{1}{2}+\frac{1}{3}\right)-\left(1-\frac{1}{2}+\frac{4}{3}\right)=?$

Yanıt / The Answer is 0

8. $\left(\frac{2}{9}-\frac{2}{3}+\frac{1}{7}\right)-\left(1-\frac{2}{3}+\frac{2}{9}\right)+\frac{6}{7}=?$

Yanıt / The Answer is 0

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $\left(\frac{1}{5}-\frac{3}{4}+\frac{2}{3}\right)-\left(\frac{2}{3}-\frac{4}{5}+\frac{5}{4}\right)=?$

Yanıt / The Answer is –1

10. $x=\frac{5}{2}-\frac{4}{3}+\frac{2}{5}+\frac{5}{7}$

$y=\frac{1}{2}+\frac{1}{3}+\frac{8}{5}-\frac{5}{7}$

$\Rightarrow x+y=?$

Yanıt / The Answer is 4

11. $2-\frac{2}{5}\cdot\frac{10}{3}=?$

Yanıt / The Answer is $\frac{2}{3}$

12. $\frac{2}{3}\cdot\left(1-\frac{1}{4}\right)-\frac{1}{2}=?$

Yanıt / The Answer is 0

13. $\frac{8}{9}\cdot\left(\frac{27}{8}+\frac{9}{4}\right)=?$

Yanıt / The Answer is 5

14. $3-\frac{4}{3}:\frac{2}{5}=?$

Yanıt / The Answer is $-\frac{1}{3}$

15. $\frac{5}{3}:\left(\frac{1}{3}+\frac{1}{2}\right)=?$

Yanıt / The Answer is 2

16. $\frac{2}{3}+\frac{\frac{1}{3}}{7}=?$

Yanıt / The Answer is 3

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17. $102\frac{2}{3} - 99\frac{1}{6} = ?$

Yanıt / The Answer is $\frac{7}{2}$

18. $2018\frac{5}{3} - 2018\frac{2}{3} = ?$

Yanıt / The Answer is 1

19. $\frac{1}{5} \cdot \frac{2}{3} + \frac{3}{5} \cdot \frac{1}{2} = ?$

Yanıt / The Answer is $\frac{13}{30}$

20. $\left(2+\frac{1}{2}\right) \cdot \left(1-\frac{1}{3}\right) \cdot \left(1+\frac{1}{5}\right) = ?$

Yanıt / The Answer is 2

21. $2 \cdot \left(1-\frac{2}{3}\right) - 3 \cdot \left(1-\frac{1}{9}\right) = ?$

Yanıt / The Answer is –2

22. $\left(\frac{2}{3}-1\right) \cdot \left(1-\frac{3}{2}\right) - \frac{1}{3} = ?$

Yanıt / The Answer is $-\frac{1}{6}$

23. $2 - \frac{1}{3} \cdot \left[1 - \frac{1}{5} \cdot \left(1+\frac{1}{4}\right)\right] = ?$

Yanıt / The Answer is $\frac{7}{4}$

24. $\left(1+\frac{1}{5}\right) \cdot \left(1+\frac{1}{6}\right) \cdot \left(1+\frac{1}{7}\right) = ?$

Yanıt / The Answer is $\frac{8}{5}$

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25. $\left(1-\frac{1}{4}\right)\cdot\left(1-\frac{1}{5}\right)\cdot\left(1-\frac{1}{6}\right)=?$

Yanıt / The Answer is $\frac{1}{2}$

26. $\left(1+\frac{1}{3}\right)\cdot\left(1+\frac{1}{4}\right)\cdot\left(1+\frac{1}{5}\right)\cdot\ \ldots\ \cdot\left(1+\frac{1}{20}\right)=?$

Yanıt / The Answer is 7

27. $\left(1-\frac{1}{6}\right)\cdot\left(1-\frac{1}{7}\right)\cdot\left(1-\frac{1}{8}\right)\cdot\ldots\cdot\left(1-\frac{1}{25}\right)=?$

Yanıt / The Answer is $\frac{1}{5}$

28. $\frac{60}{11}\cdot\left(\frac{1}{2}+\frac{1}{12}-\frac{1}{30}\right)=?$

Yanıt / The Answer is 3

29. $\dfrac{2-\frac{2}{3}}{3}+\dfrac{2}{1+\frac{1}{2}}=?$

Yanıt / The Answer is $\frac{16}{9}$

30. $\dfrac{1+\frac{1}{3}}{1-\frac{1}{3}}-\dfrac{1-\frac{1}{2}}{1+\frac{1}{2}}=?$

Yanıt / The Answer is $\frac{5}{3}$

31. $\dfrac{\frac{1}{5}-2}{2+\frac{1}{4}}+\frac{3}{10}=?$

Yanıt / The Answer is $-\frac{1}{2}$

32. $\dfrac{1-\frac{1}{12}}{1-\frac{7}{9}}\cdot\left(5-\frac{7}{3}\right)=?$

Yanıt / The Answer is 11

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33. $\dfrac{3}{2+\dfrac{3}{4}}+\left(1-\dfrac{1}{11}\right)=?$

Yanıt / The Answer is 2

34. $\dfrac{4}{3-\dfrac{1}{1-\dfrac{1}{3}}}=?$

Yanıt / The Answer is $\frac{8}{3}$

35. $\dfrac{1}{\dfrac{5}{4}-\left(\dfrac{3}{2}-\dfrac{1}{3}\right)}=?$

Yanıt / The Answer is 12

36. $\dfrac{\dfrac{2}{7}\cdot\left(3-\dfrac{2}{3}\right)}{1-\dfrac{5}{3}}=?$

Yanıt / The Answer is –1

37. $\dfrac{2}{3}-\dfrac{3}{5-\dfrac{1}{2}}\cdot\left(\dfrac{2}{3}-1\right)=?$

Yanıt / The Answer is $\frac{8}{9}$

38. $\left(\dfrac{5}{9}-\dfrac{1}{3}:\dfrac{3}{2}\right)+\dfrac{1}{2}:\dfrac{3}{5}=?$

Yanıt / The Answer is $\frac{7}{6}$

39. $\dfrac{1+\dfrac{2}{3}}{2-\dfrac{3}{4}}\cdot\left(2-\dfrac{1}{2}\right)=?$

Yanıt / The Answer is 2

40. $\left(4+\dfrac{1}{3}\right):2\dfrac{8}{9}-1=?$

Yanıt / The Answer is $\frac{1}{2}$

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41. $1-\dfrac{1+\frac{3}{4}}{2+\frac{1}{3}}=?$

Yanıt / The Answer is $\frac{1}{4}$

---

42. $\dfrac{5-\frac{1}{2}}{2+\frac{1}{2}}:\left(1+\frac{4}{5}\right)=?$

Yanıt / The Answer is 1

---

43. $\dfrac{\frac{2}{3}}{4}-\dfrac{2}{\frac{3}{4}}=?$

Yanıt / The Answer is $\frac{-5}{2}$

---

44. $1+\dfrac{2}{1-\frac{1}{3}}\cdot\dfrac{1}{6}=?$

Yanıt / The Answer is $\frac{3}{2}$

45. $1-\dfrac{1}{\frac{4}{5}}+\dfrac{\frac{3}{4}}{5}=?$

Yanıt / The Answer is $-\frac{1}{10}$

---

46. $\dfrac{2}{\frac{4}{5}+1}-\dfrac{\frac{1}{3}+1}{4}=?$

Yanıt / The Answer is $\frac{7}{9}$

---

47. $2+\dfrac{1-\frac{2}{3}}{\frac{3}{4}-\frac{1}{2}}=?$

Yanıt / The Answer is $\frac{10}{3}$

---

48. $1+\dfrac{1}{2-\dfrac{1}{1-\frac{1}{4}}}=?$

Yanıt / The Answer is $\frac{5}{2}$

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49. $1+\dfrac{4}{2-\dfrac{3}{3-\dfrac{2}{3}}}=?$

Yanıt / The Answer is $\dfrac{33}{5}$

53. $\dfrac{1}{3}+\dfrac{1-\dfrac{1-\dfrac{1}{3}}{3}}{\dfrac{3}{2}-1}:\dfrac{1}{3}=?$

Yanıt / The Answer is 5

50. $2-\dfrac{2}{1+\dfrac{1}{2-\dfrac{1}{3}}}=?$

Yanıt / The Answer is $\dfrac{3}{4}$

54. $1+\dfrac{1}{1-\dfrac{1}{1+\dfrac{1}{2}}}:3=?$

Yanıt / The Answer is 2

51. $\dfrac{1+\dfrac{1+\dfrac{1}{2}}{3}}{\dfrac{1}{2}-\dfrac{1}{2-\dfrac{1}{3}}}=?$

Yanıt / The Answer is –15

55. $1-\dfrac{1}{1-\dfrac{1}{2}}:\dfrac{1}{1-\dfrac{1}{3}}=?$

Yanıt / The Answer is $-\dfrac{1}{3}$

52. $2+\dfrac{1-\dfrac{1}{2}}{2-\dfrac{1}{\dfrac{1}{2}-\dfrac{1}{3}}}=?$

Yanıt / The Answer is $\dfrac{15}{8}$

56. $2+\dfrac{1}{3-\dfrac{1}{3-\dfrac{5}{2}}}=?$

Yanıt / The Answer is 3

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57. $5+\cfrac{6}{5+\cfrac{6}{5+\cfrac{6}{\vdots}}}=?$

Yanıt / The Answer is 6

58. $6+\cfrac{5}{4+\cfrac{5}{4+\cfrac{5}{\vdots}}}=?$

Yanıt / The Answer is 7

59. $1+\cfrac{6}{1+\cfrac{6}{1+\cfrac{6}{\vdots}}}=?$

Yanıt / The Answer is 3

60. $2+\cfrac{2+\cfrac{2+\cfrac{2+\cfrac{\vdots}{3}}{3}}{3}}{3}=?$

Yanıt / The Answer is 3

61. $2+\cfrac{x}{2+\cfrac{x}{2+\cfrac{x}{\vdots}}}=4 \Rightarrow x=?$

Yanıt / The Answer is 8

62. $\frac{1}{3}+\frac{1}{4}+\frac{1}{5}=x$

$\frac{2}{3}+\frac{3}{4}+\frac{4}{5}=y \Rightarrow y=?$

Yanıt / The Answer is 3 – x

63. $\frac{3}{4}+\frac{4}{5}+\frac{1}{6}=x$

$\frac{1}{4}+\frac{6}{5}-\frac{13}{6}=y \Rightarrow y=?$

Yanıt / The Answer is 1 – x

64. $\frac{3}{10}-\frac{4}{11}-\frac{5}{12}=x$

$\frac{7}{10}-\frac{7}{11}-\frac{7}{12}=y \Rightarrow y=?$

Yanıt / The Answer is –1 – x

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65. $x=\frac{3}{5},\ y=\frac{2}{3},\ z=\frac{13}{15} \Rightarrow ?<?<?$

Yanıt / The Answer is x < y < z

66. $a=\frac{4}{7},\ b=\frac{11}{14},\ c=\frac{19}{21} \Rightarrow ?<?<?$

Yanıt / The Answer is a < b < c

67. $x=\frac{2}{7},\ y=\frac{3}{10},\ z=\frac{6}{13} \Rightarrow ?<?<?$

Yanıt / The Answer is x < y < z

68. $a=\frac{4}{9},\ b=\frac{3}{8},\ c=\frac{6}{11} \Rightarrow ?<?<?$

Yanıt / The Answer is b < a < c

69. $x=\frac{8}{5},\ y=\frac{19}{15},\ z=\frac{13}{6} \Rightarrow ?<?<?$

Yanıt / The Answer is y < x < z

70. $a=\frac{12}{7},\ b=\frac{24}{13},\ c=\frac{48}{15} \Rightarrow ?<?<?$

Yanıt / The Answer is a < b < c

71. $x=\frac{-7}{3},\ y=\frac{-5}{2},\ z=\frac{-13}{6} \Rightarrow ?<?<?$

Yanıt / The Answer is y < x < z

72. $x=\frac{-7}{3},\ y=\frac{-11}{6},\ z=\frac{-23}{12} \Rightarrow ?<?<?$

Yanıt / The Answer is x < z < y

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73. $x = \frac{-8}{15},\ y = \frac{-19}{30},\ z = \frac{-38}{45} \Rightarrow$ **? < ? < ?**

Yanıt / The Answer is z < y < x

74. $a = \frac{-4}{9},\ b = \frac{-2}{3},\ c = \frac{-5}{6} \Rightarrow$ **? < ? < ?**

Yanıt / The Answer is c < b < a

75. $x = \frac{9}{11},\ y = \frac{13}{15},\ z = \frac{19}{21} \Rightarrow$ **? < ? < ?**

Yanıt / The Answer is x < y < z

76. $a = \frac{103}{106},\ b = \frac{97}{100},\ c = \frac{121}{124} \Rightarrow$ **? < ? < ?**

Yanıt / The Answer is b < a < c

77. $x = \frac{12}{21},\ y = \frac{25}{23},\ z = \frac{27}{25} \Rightarrow$ **? < ? < ?**

Yanıt / The Answer is x < z < y

78. $a = \frac{-3}{8},\ b = \frac{-13}{18},\ c = \frac{-23}{28} \Rightarrow$ **? < ? < ?**

Yanıt / The Answer is c < b < a

79. $x = \frac{-1}{5},\ y = \frac{-3}{7},\ z = \frac{-5}{9} \Rightarrow$ **? < ? < ?**

Yanıt / The Answer is z < y < x

80. $a = \frac{-13}{11},\ b = \frac{-9}{7},\ c = \frac{-15}{13} \Rightarrow$ **? < ? < ?**

Yanıt / The Answer is b < a < c

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81. 1,3 + 2,4 + 3,5 =?

Yanıt / The Answer is 7,2

82. 2,345 + 4,78 – 3,514 = ?

Yanıt / The Answer is 3,611

83. (3 – 0,123) + (4 – 0,123) + 0,246 = ?

Yanıt / The Answer is 7

84. (1,2) · (4,5) = ?

Yanıt / The Answer is 5,4

85. (2,4) · (3,6) = ?

Yanıt / The Answer is 8,64

86. $\frac{1,2}{0,4} + \frac{0,16}{0,008} = ?$

Yanıt / The Answer is 23

87. $\frac{0,23}{0,023} + \frac{2,3}{0,23} = ?$

Yanıt / The Answer is 20

88. $\frac{3,45}{34,5} - \frac{34,5}{3,45} = ?$

Yanıt / The Answer is –9,9

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89. $(1 - 0,8) + (2 - 0,2) - 0,5 = ?$

Yanıt / The Answer is 1,5

90. $(2,24)\cdot(0,25) + 1,32 = ?$

Yanıt / The Answer is 1,88

91. $\frac{2}{0,1} + \frac{4}{0,05} = ?$

Yanıt / The Answer is 100

92. $\frac{2}{0,01} + \frac{4}{0,02} - \frac{6}{0,03} = ?$

Yanıt / The Answer is 200

93. $\frac{1}{0,1} - \frac{1}{0,01} + \frac{1}{0,001} = ?$

Yanıt / The Answer is 910

94. $\frac{0,016}{0,04} + \frac{0,34}{0,017} - \frac{0,35}{0,05} = ?$

Yanıt / The Answer is 13,4

95. $\frac{0,6+1,2}{2,4-1,8} - \frac{0,3}{0,03} = ?$

Yanıt / The Answer is –7

96. $\frac{1}{0,01} + \frac{1}{0,02} + \frac{1}{0,004} = ?$

Yanıt / The Answer is 400

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97. $\dfrac{0,34}{0,0017}-\dfrac{4,04}{0,202}+\dfrac{5,1}{1,7}=?$

Yanıt / The Answer is 183

98. $\dfrac{0,039}{0,03}+\dfrac{0,21}{0,3}-\dfrac{0,04}{2\cdot(0,02)}=?$

Yanıt / The Answer is 1

99. $\dfrac{\dfrac{1}{0,02}+\dfrac{1}{0,4}}{\dfrac{1}{0,04}+\dfrac{1}{0,8}}=?$

Yanıt / The Answer is 2

100. $\dfrac{5,6}{0,07}+\dfrac{0,16}{0,04}-\dfrac{0,63}{0,009}=?$

Yanıt / The Answer is 14

101. x,y aralarında asaldır. / x and y are relatively primes.

$0,\overline{18}=\dfrac{x}{y} \Rightarrow x+y=?$

Yanıt / The Answer is 13

102. x,y aralarında asaldır. / x and y are relatively primes.

$0,1\overline{26}=\dfrac{x}{y} \Rightarrow \sqrt{x+y}=?$

Yanıt / The Answer is 13

103. x,y aralarında asaldır. / x and y are relatively primes.

$1,2\overline{4}=\dfrac{x}{y} \Rightarrow x-y=?$

Yanıt / The Answer is 11

104. x = 0,3 + 0,03 + 0,003 + ...

$\Rightarrow$ **x = ?**

Yanıt / The Answer is $\frac{1}{3}$

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105. $x = 4 + 0{,}5 + 0{,}05 + 0{,}005 + \ldots$

$\Rightarrow$ **x = ?**

Yanıt / The Answer is $\frac{41}{9}$

106. $\frac{0{,}3+0{,}6}{0{,}\overline{3}+0{,}\overline{6}}+0{,}11 = ?$

Yanıt / The Answer is 1,01

107. $\frac{2{,}4\overline{9}+3{,}4\overline{9}}{0{,}\overline{7}+1{,}\overline{2}} = ?$

Yanıt / The Answer is 3

108. $\frac{6{,}\overline{9}}{4{,}4\overline{5}+2{,}5\overline{4}} = ?$

Yanıt / The Answer is 1

109. $\frac{0{,}\overline{3}+0{,}\overline{45}}{0{,}0\overline{39}} = ?$

Yanıt / The Answer is 20

110. $\frac{1}{0{,}\overline{8}}+\frac{1}{0{,}\overline{2}}-\frac{1}{0{,}\overline{4}} = ?$

Yanıt / The Answer is $\frac{27}{8}$

111. $\frac{1}{0{,}1\overline{3}}-\frac{1}{0{,}\overline{36}}-\frac{1}{0{,}\overline{4}} = ?$

Yanıt / The Answer is $\frac{5}{2}$

112. $x = 2{,}\overline{9},\quad y = 8{,}\overline{9}\quad z = 0{,}\overline{5}$

$\Rightarrow \frac{1}{x}+\frac{1}{y}+z = ?$

Yanıt / The Answer is 1

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113. $a = 0,\overline{9}, \quad b = 0,\overline{4}, \quad c = 1,\overline{7}, \quad d = 0,\overline{3}$

$\Rightarrow \dfrac{a+b}{c-d} = ?$

Yanıt / The Answer is 1

114. $a = 0,\overline{15}, \quad b = 0,\overline{6}, \quad c = 0,\overline{3}$

$\Rightarrow \dfrac{a+b}{c} = ?$

Yanıt / The Answer is $\dfrac{27}{11}$

115. $\dfrac{0,\overline{3}+0,\overline{7}+0,\overline{1}}{0,\overline{6}-1,\overline{3}+0,\overline{5}} = ?$

Yanıt / The Answer is –11

116. $\dfrac{0,0\overline{9}+0,\overline{9}}{0,0\overline{4}+0,\overline{4}} = ?$

Yanıt / The Answer is $\dfrac{9}{4}$

117. $\dfrac{1-0,\overline{2}}{0,\overline{4}-2} = ?$

Yanıt / The Answer is $-\dfrac{1}{2}$

118. $0,\overline{9}+\dfrac{1,\overline{9}-\dfrac{1}{2,\overline{9}}}{0,\overline{9}-\dfrac{1}{5,\overline{9}}} = ?$

Yanıt / The Answer is 3

119. $\dfrac{0,\overline{77}+0,5\overline{5}}{0,8\overline{8}} = ?$

Yanıt / The Answer is $\dfrac{3}{2}$

120. $0,\overline{9}+\dfrac{0,\overline{2}}{0,\overline{3}-0,\overline{5}} = ?$

Yanıt / The Answer is 0

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121. $\dfrac{0,\overline{a}}{a} + \dfrac{0,\overline{b}}{b} = ?$

Yanıt / The Answer is $\dfrac{2}{9}$

122. $(6,\overline{3} - 5,\overline{2})\cdot(2,\overline{6} + 0,\overline{3}) = ?$

Yanıt / The Answer is $\dfrac{10}{3}$

123. $2,\overline{3} - \dfrac{0,0\overline{3}}{0,\overline{3} - 0,2\overline{3}} = ?$

Yanıt / The Answer is 2

124. $\dfrac{\dfrac{4}{3} - 0,\overline{3}}{2 - 1,\overline{3}} : \dfrac{1}{1,\overline{9}} = ?$

Yanıt / The Answer is 3

125. $0,\overline{9} - \dfrac{7,\overline{1} - 0,\overline{1}}{1,\overline{5} - 0,\overline{5}} : (6,3) = ?$

Yanıt / The Answer is $-\dfrac{1}{9}$

126. $3,\overline{3} + \dfrac{1,\overline{6} + 0,\overline{3}}{2,\overline{2} - 0,\overline{2}} - 2\cdot(1,\overline{9}) = ?$

Yanıt / The Answer is $\dfrac{1}{3}$

127. $\dfrac{1,\overline{4} + 0,\overline{5}}{2,\overline{8} - 0,\overline{8}} : \dfrac{1}{2} = ?$

Yanıt / The Answer is 2

128. $\left.\begin{array}{l} x = 3,54\overline{7} \\ y = 3,\overline{547} \\ z = 3,5\overline{47} \end{array}\right\} \Rightarrow\ ? > ? > ?$

Yanıt / The Answer is x > y > z

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1. $\frac{2}{3}+\frac{4}{5}+\frac{1}{2}=?$

A) $\frac{59}{30}$ B) 2 C) $\frac{61}{30}$ D) $\frac{31}{10}$ E) $\frac{21}{10}$

2. $\frac{1}{8}+\frac{1}{5}+\frac{1}{2}=?$

A) $\frac{31}{40}$ B) $\frac{4}{5}$ C) $\frac{33}{40}$ D) $\frac{17}{20}$ E) $\frac{7}{8}$

3. $1+\frac{1}{3}+\frac{1}{6}+\frac{1}{9}=?$

A) $\frac{17}{8}$ B) $\frac{19}{18}$ C) $\frac{23}{18}$ D) $\frac{29}{18}$ E) $\frac{31}{18}$

4. $\frac{1}{2}+\frac{1}{3}+\frac{1}{4}=?$

A) $\frac{11}{12}$ B) 1 C) $\frac{13}{12}$ D) $\frac{7}{6}$ E) $\frac{5}{4}$

5. $\frac{1}{6}-\frac{1}{5}+\frac{1}{10}=?$

A) $\frac{1}{15}$ B) $\frac{2}{15}$ C) $\frac{1}{5}$ D) $\frac{4}{15}$ E) $\frac{1}{3}$

6. $\left(8-\frac{3}{5}\right)-\left(\frac{2}{5}+8\right)=?$

A) $-\frac{1}{5}$ B) $-\frac{3}{5}$ C) -1 D) 16 E) $\frac{82}{5}$

7. $\frac{1}{3}-\left(\frac{1}{2}+\frac{1}{3}\right)+\left(\frac{2}{3}+\frac{1}{2}\right)=?$

A) $\frac{1}{6}$ B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$ E) $\frac{5}{6}$

8. $\frac{1}{63}-\left(\frac{1}{64}+\frac{1}{63}\right)+\left(\frac{2}{3}+\frac{1}{64}\right)=?$

A) $\frac{2}{3}$ B) $\frac{1}{32}$ C) $\frac{1}{63}$ D) $\frac{2}{63}$ E) $\frac{63}{64}$

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9. $\left(\frac{1}{2}+\frac{1}{3}-\frac{1}{4}\right)+\left(1-\frac{1}{2}+\frac{1}{4}\right)=?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{2}{3}$ E) $\frac{4}{3}$

10. $\left(3+\frac{1}{3}\right)-\left(3-\frac{1}{3}\right)=?$

A) $-\frac{1}{3}$ B) $\frac{1}{3}$ C) $\frac{2}{3}$ D) 1 E) $\frac{4}{3}$

11. $\frac{3}{2}-\left(\frac{4}{3}+\frac{3}{2}\right)+\left(\frac{3}{10}+\frac{4}{3}-\frac{1}{2}\right)=?$

A) –1 B) $-\frac{4}{5}$ C) $-\frac{3}{5}$ D) $-\frac{2}{5}$ E) $-\frac{1}{5}$

12. $\left(4+\frac{2}{5}\right)-\left(4-\frac{3}{5}\right)=?$

A) 1 B) 2 C) 3 D) 4 E) 5

13. $\left(\frac{3}{8}-\frac{4}{5}+\frac{9}{10}\right)-\left(\frac{3}{8}+\frac{1}{5}-\frac{1}{10}\right)=?$

A) 0 B) $\frac{1}{10}$ C) $\frac{1}{5}$ D) $\frac{1}{2}$ E) 1

14. $\frac{1}{x}-\left(\frac{1}{x}-\frac{1}{y}\right)-\left(\frac{1}{x}+\frac{1}{y}-\frac{1}{2x}\right)=?$

A) $\frac{-1}{2x}$ B) $\frac{-x}{y}$ C) $\frac{3}{2x}$ D) $\frac{-3}{2x}$ E) $\frac{1}{2x}$

15. $\left(1-\frac{1}{2}\right)+\left(2-\frac{1}{2}\right)+\ldots+\left(10-\frac{1}{2}\right)=?$

A) 40 B) 45 C) 50 D) 55 E) 60

16. $\left(1-\frac{1}{2}\right)+\left(2-\frac{1}{2}\right)+\ldots\ldots\left(n-\frac{1}{2}\right)=72$

$\Rightarrow n = ?$

A) 10 B) 11 C) 12 D) 13 E) 14

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	C	D	C	A	C	D	A
9	10	11	12	13	14	15	16
E	C	E	A	A	A	C	C

1. $\underbrace{\frac{1}{2}-\frac{1}{3}+\frac{1}{2}-\frac{1}{3}+\ldots+\frac{1}{2}-\frac{1}{3}}_{\text{20 terim / terms}}=?$

A) $\frac{5}{3}$ B) $\frac{3}{5}$ C) $\frac{2}{5}$ D) $\frac{5}{2}$ E) 1

2. $\underbrace{\frac{1}{3}-\frac{1}{4}+\frac{1}{3}-\frac{1}{4}+\ldots-\frac{1}{4}+\frac{1}{3}}_{\text{23 terim / terms}}=?$

A) $\frac{7}{5}$ B) $\frac{5}{4}$ C) $\frac{12}{11}$ D) $\frac{13}{6}$ E) $\frac{1}{12}$

3. $2\frac{1}{2}-1\frac{1}{3}=?$

A) $\frac{7}{6}$ B) 1 C) $\frac{5}{6}$ D) $\frac{2}{3}$ E) $\frac{1}{2}$

4. $\frac{1}{2}\cdot\frac{2}{3}\cdot\frac{3}{4}\cdot\ldots\cdot\frac{16}{17}=?$

A) $\frac{1}{2}$ B) $\frac{1}{6}$ C) $\frac{1}{12}$ D) $\frac{1}{16}$ E) $\frac{1}{17}$

5. $\left(\frac{a}{a+1}\right)\cdot\left(\frac{a+1}{a+2}\right)\cdot\ldots\cdot\left(\frac{a+9}{a+10}\right)=3 \Rightarrow a=?$

A) –20 B) –15 C) –10 D) 15 E) 20

6. $\left(1\frac{1}{5}\right)\cdot\left(1\frac{1}{6}\right)\cdot\left(1\frac{1}{7}\right)\cdot\ldots\cdot\left(1\frac{1}{21}\right)=?$

A) 4 B) $\frac{21}{5}$ C) $\frac{22}{5}$ D) $\frac{23}{5}$ E) 5

7. $\left(1\frac{1}{2}\right)\cdot\left(1\frac{1}{3}\right)\cdot\left(1\frac{1}{4}\right)\cdot\ldots\cdot\left(1\frac{1}{18}\right)=?$

A) $\frac{1}{19}$ B) $\frac{1}{18}$ C) $\frac{1}{9}$ D) $\frac{19}{2}$ E) 19

8. $\left(1\frac{1}{2}\right)\cdot\left(1\frac{1}{3}\right)\cdot\left(1\frac{1}{4}\right)\cdot\ldots\cdot\left(1\frac{1}{a}\right)=48$

$\Rightarrow a=?$

A) 90 B) 92 C) 95 D) 97 E) 100

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9 $\left(\frac{4}{7}:\frac{3}{14}\right)\cdot\frac{3}{4}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

10. $\frac{3}{10}-\frac{2}{10}:\frac{1}{5}=?$

A) $-\frac{3}{5}$ B) $-\frac{7}{10}$ C) 1 D) $\frac{3}{5}$ E) $\frac{10}{7}$

11. $\left(\frac{1}{4}-4\right)\cdot\left(1-\frac{11}{15}\right)=?$

A) $-\frac{3}{4}$ B) –1 C) $\frac{1}{2}$ D) $\frac{3}{4}$ E) 1

12. $\left(2\frac{1}{2}-1\frac{1}{3}\right):\left(1\frac{1}{4}-\frac{5}{6}\right)=?$

A) $\frac{7}{6}$ B) $\frac{12}{5}$ C) $\frac{11}{12}$ D) $\frac{14}{5}$ E) $\frac{13}{24}$

13. $2\frac{2}{3}-\frac{2}{5}\cdot\frac{3}{4}=?$

A) $\frac{17}{20}$ B) $\frac{19}{20}$ C) $\frac{23}{30}$ D) $\frac{57}{30}$ E) $\frac{71}{30}$

14. $2-\frac{1}{2}:\dfrac{1-\frac{1}{4}}{1+\frac{1}{4}}=?$

A) $\frac{1}{6}$ B) $\frac{1}{2}$ C) $\frac{2}{3}$ D) $\frac{5}{6}$ E) $\frac{7}{6}$

15. $\dfrac{\frac{2}{3}}{8}+\dfrac{3}{\frac{12}{13}}=?$

A) $\frac{8}{3}$ B) 3 C) $\frac{10}{3}$ D) $\frac{11}{3}$ E) 4

16. $\left[\dfrac{\frac{1}{8}}{\frac{1}{4}}:\dfrac{3}{\frac{1}{3}}\right]^{-1}=?$

A) $\frac{1}{18}$ B) $\frac{1}{9}$ C) 1 D) 9 E) 18

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	B	A	E	B	C	D	C
9	10	11	12	13	14	15	16
B	B	B	D	E	E	C	E

1. $\dfrac{\frac{3}{5}}{4} - \dfrac{3}{\frac{5}{4}} = ?$

A) $-\frac{9}{4}$ B) $-\frac{5}{4}$ C) $-\frac{1}{4}$ D) $\frac{5}{4}$ E) $\frac{9}{4}$

2. $\frac{1}{4} + \frac{1}{3} : \frac{4}{5} - \frac{1}{2} = ?$

A) $\frac{5}{6}$ B) $\frac{2}{3}$ C) $\frac{1}{2}$ D) $\frac{1}{6}$ E) $\frac{1}{12}$

3. $\frac{1}{3} - \frac{1}{3} : \frac{1}{3} + \frac{1}{3} \cdot \frac{1}{3} = ?$

A) $-\frac{10}{9}$ B) $-\frac{11}{9}$ C) $-\frac{5}{9}$ D) $-\frac{13}{9}$ E) $-\frac{14}{9}$

4. $\left(2\frac{2}{9} : \frac{5}{3}\right) + \frac{1}{3} : \frac{4}{3} - \frac{1}{3} = ?$

A) $\frac{3}{4}$ B) 1 C) $\frac{5}{4}$ D) $\frac{3}{2}$ E) $\frac{7}{4}$

5. $3 + \dfrac{1}{1 - \frac{3}{5}} = ?$

A) $\frac{5}{2}$ B) $\frac{7}{2}$ C) $\frac{9}{2}$ D) $\frac{11}{2}$ E) $\frac{13}{2}$

6. $\left(\frac{2}{3} + \frac{3}{5}\right) : \left(\frac{4}{9} - \frac{2}{15}\right) = ?$

A) $\frac{12}{7}$ B) $\frac{18}{7}$ C) $\frac{27}{14}$ D) $\frac{43}{14}$ E) $\frac{57}{14}$

7. $x \neq 0,\ y \neq 0,\ z > 0$,

$$\dfrac{\frac{3x}{y}}{z} = \dfrac{x}{\frac{27y}{z}} \Rightarrow z = ?$$

A) 3 B) 6 C) 9 D) 12 E) 15

8. $\left(\dfrac{-1}{\frac{2}{3}}\right)^{-2} \cdot \left(\dfrac{\frac{2}{3}}{2}\right)^{-3} = ?$

A) 8 B) 10 C) 12 D) 14 E) 16

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9. $1+\dfrac{1-\frac{2}{5}}{1+\frac{2}{5}}=?$

A) $\frac{6}{7}$ B) 1 C) $\frac{8}{7}$ D) $\frac{9}{7}$ E) $\frac{10}{7}$

10. $\dfrac{24\cdot\left(\frac{1}{4}+\frac{1}{6}\right)}{\frac{1}{4}+6}=?$

A) $\frac{6}{5}$ B) $\frac{8}{5}$ C) $\frac{12}{5}$ D) $\frac{14}{5}$ E) $\frac{16}{5}$

11. $\dfrac{\frac{1}{2}+\frac{1}{3}}{\left(\frac{2}{5}+\frac{4}{5}\right)^{-1}}=?$

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) 2

12. $\left(\dfrac{1-\frac{2}{5}}{1+\frac{2}{5}}\right):\left(1-\dfrac{1}{-\frac{3}{4}}\right)=?$

A) $\frac{5}{7}$ B) $\frac{7}{9}$ C) $\frac{9}{14}$ D) $\frac{7}{36}$ E) $\frac{9}{49}$

13. $\dfrac{\left(\frac{1}{2}-\frac{1}{4}\right):4^{-1}}{\left(\frac{1}{3}-\frac{1}{6}\right):6^{-1}}=?$

A) $\frac{1}{2}$ B) $\frac{1}{6}$ C) 1 D) 2 E) 3

14. $\left(1-\frac{1}{2}\right)\cdot\left(1-\frac{1}{3}\right)\cdot\ \dots\ \cdot\left(1-\frac{1}{15}\right)=?$

A) 1 B) $\frac{1}{3}$ C) $\frac{1}{5}$ D) $\frac{1}{15}$ E) $\frac{1}{30}$

15. $\left(1-\frac{1}{2}\right)\cdot\left(1-\frac{1}{3}\right)\cdot\left(1-\frac{1}{4}\right)\cdot\ \dots\ \cdot\left(1-\frac{1}{16}\right)=A \Rightarrow 8\cdot A=?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) $\frac{1}{6}$

16. $\left(1-\frac{1}{2}\right)\cdot\left(1+\frac{1}{2}\right)\cdot\left(1+\frac{1}{4}\right)=1-\frac{1}{2^x} \Rightarrow x=?$

A) 1 B) 2 C) 3 D) 4 E) 5

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	D	C	C	D	E	C	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
E	B	C	E	C	D	A	D

1. $1+\dfrac{1+\dfrac{1}{3}}{1-\dfrac{1}{3}}=?$

A) 1 B) 2 C) 3 D) 4 E) 6

2. $2-\dfrac{3-\dfrac{7}{11}}{\dfrac{7}{11}-3}=?$

A) 1 B) 3 C) 7 D) 11 E) 15

3. $1+\dfrac{2-\dfrac{2}{5}}{2+\dfrac{2}{5}}=?$

A) 1 B) $\frac{3}{5}$ C) $\frac{2}{5}$ D) $\frac{5}{3}$ E) $\frac{5}{2}$

4. $3-\dfrac{1}{2-\dfrac{1}{1-\dfrac{1}{3}}}=?$

A) 2 B) $\frac{4}{3}$ C) 1 D) $\frac{2}{3}$ E) $\frac{1}{2}$

5. $2-\dfrac{\dfrac{1}{3}:\dfrac{3}{4}}{\dfrac{1}{4}:\dfrac{4}{3}}=?$

A) $-\frac{10}{3}$ B) $-\frac{5}{3}$ C) $-\frac{10}{9}$ D) $-\frac{5}{9}$ E) $-\frac{10}{27}$

6. $\dfrac{\dfrac{1}{2}+\dfrac{1}{3}}{\left(\dfrac{2}{5}+\dfrac{4}{5}\right)^{-1}}=?$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 1 E) 2

7. $\dfrac{\dfrac{1}{2}-\dfrac{1}{3}:\dfrac{1}{5}}{1-\left(\dfrac{1}{2}+\dfrac{2}{3}\right)}=?$

A) 4 B) 5 C) 6 D) 7 E) 8

8. $\dfrac{2+\dfrac{1}{2}}{2}-\dfrac{2}{2+\dfrac{1}{2}}=?$

A) $\frac{7}{10}$ B) $\frac{9}{10}$ C) $\frac{7}{20}$ D) $\frac{9}{20}$ E) $\frac{11}{20}$

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9. $\dfrac{\dfrac{x}{\frac{2}{3}}}{} - \dfrac{\frac{x}{2}}{3} = 2 \Rightarrow x = ?$

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) $\frac{2}{3}$ D) $\frac{3}{2}$ E) $\frac{4}{3}$

10. $2 - \dfrac{\frac{1}{2} + \frac{1}{3}}{\frac{5}{2} + \frac{5}{3}} = ?$

A) $\frac{9}{5}$ B) $\frac{7}{5}$ C) 1 D) $\frac{3}{5}$ E) $\frac{1}{5}$

11. $\dfrac{2^{-1} \cdot \left(\frac{1}{2}\right)^{-1}}{\left(2 + \frac{1}{2}\right)^{-1}} = ?$

A) $\frac{13}{4}$ B) $\frac{15}{4}$ C) $\frac{5}{2}$ D) $\frac{27}{4}$ E) $\frac{35}{4}$

12. $\dfrac{\frac{1}{3} + \dfrac{1}{\frac{1}{3} + \dfrac{1}{\frac{1}{3}}}}{\frac{1}{3} + \dfrac{1}{\frac{1}{3}}} = ?$

A) $\frac{10}{3}$ B) $\frac{3}{10}$ C) $\frac{19}{30}$ D) $\frac{13}{100}$ E) $\frac{19}{100}$

13. $2 - \dfrac{4 - \frac{1}{3} + 1}{3 - \frac{1}{4} + 1} = ?$

A) $\frac{34}{45}$ B) $\frac{7}{9}$ C) $\frac{4}{5}$ D) $\frac{37}{45}$ E) $\frac{38}{45}$

14. $\dfrac{\left(3 - \frac{1}{3}\right) + \left(\frac{1}{3} + 3\right)}{\left(5 + \frac{6}{5}\right) - \left(5 + \frac{1}{5}\right)} = ?$

A) $\frac{3}{5}$ B) 3 C) $\frac{6}{5}$ D) 6 E) $\frac{8}{5}$

15. $\dfrac{4 - \frac{3}{7}}{1 + \frac{1}{7}} \cdot \dfrac{3 - \frac{1}{3}}{5 - \frac{5}{6}} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 2 D) 4 E) 6

16. $2 + \dfrac{\frac{1}{3} - \frac{1}{6} + \frac{1}{9}}{\frac{1}{3} + \frac{1}{6} - \frac{4}{9}} = ?$

A) 8 B) 7 C) 6 D) 4 E) 3

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	B	D	C	E	D	D	D
9	10	11	12	13	14	15	16
D	A	C	E	A	D	C	B

1. $3-\dfrac{1+\dfrac{1}{1+\dfrac{1}{2}}}{\dfrac{3}{5}}=?$

A) $\frac{1}{9}$ B) $\frac{2}{9}$ C) $\frac{1}{3}$ D) $\frac{4}{9}$ E) $\frac{5}{9}$

2. $1\frac{1}{3}-\dfrac{1-\dfrac{3}{5}}{2-\dfrac{1}{5}}=?$

A) $\frac{10}{9}$ B) 1 C) $\frac{8}{9}$ D) $\frac{7}{9}$ E) $\frac{2}{3}$

3. $\dfrac{\left(2-\dfrac{1}{2}\right)+\left(3+\dfrac{1}{3}\right)}{\left(4-\dfrac{1}{4}\right)+\left(4+\dfrac{1}{4}\right)}=?$

A) $\frac{29}{48}$ B) $\frac{31}{48}$ C) $\frac{17}{24}$ D) $\frac{35}{48}$ E) $\frac{13}{16}$

4. $\dfrac{3\frac{1}{2}}{4\frac{1}{5}}+\dfrac{7}{6}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

5. $2-\dfrac{\dfrac{2}{3}-\dfrac{2}{5}+\dfrac{2}{7}}{\dfrac{1}{3}-\dfrac{1}{5}+\dfrac{1}{7}}=?$

A) 0 B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) 2

6. $\dfrac{\left(3-\dfrac{2}{3}\right)+\left(2-\dfrac{1}{3}\right)}{\left(2+\dfrac{2}{5}\right)-\left(\dfrac{7}{5}-3\right)}=?$

A) 0 B) 1 C) $\frac{3}{5}$ D) $\frac{5}{3}$ E) $\frac{1}{7}$

7. $1-\dfrac{1}{2}:\dfrac{1+\dfrac{1}{3}}{1-\dfrac{1}{3}}=?$

A) $\frac{1}{2}$ B) $\frac{3}{4}$ C) 1 D) $\frac{5}{4}$ E) $\frac{4}{5}$

8. $\dfrac{1+\dfrac{1}{2+\dfrac{1}{2}}}{\dfrac{1}{5}}=?$

A) $\frac{1}{10}$ B) $\frac{1}{5}$ C) 2 D) 7 E) $\frac{5}{2}$

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9. $\dfrac{1}{19} : \dfrac{1-\dfrac{1}{4}}{3\dfrac{1}{4}-\dfrac{5}{3}} = ?$

A) $\frac{1}{9}$ B) $\frac{2}{9}$ C) $\frac{1}{3}$ D) $\frac{4}{9}$ E) $\frac{5}{9}$

10. $\dfrac{\left(\dfrac{1}{2}-\dfrac{1}{3}\right) : \dfrac{1}{6}}{\left(\dfrac{1}{3}-\dfrac{1}{4}\right) : \dfrac{5}{12}} = ?$

A) 1 B) $\frac{1}{12}$ C) 5 D) $\frac{5}{12}$ E) $\frac{1}{6}$

11. $\dfrac{\left(1-\dfrac{1}{2}\right)\cdot\left(1-\dfrac{1}{3}\right)\cdots\left(1-\dfrac{1}{10}\right)}{\left(1-\dfrac{1}{10}\right)\cdot\left(1-\dfrac{1}{11}\right)\cdot\left(1-\dfrac{1}{12}\right)\cdots\left(1-\dfrac{1}{20}\right)} = ?$

A) 2 B) $\frac{2}{9}$ C) $\frac{1}{9}$ D) $\frac{1}{10}$ E) $\frac{1}{20}$

12. $\dfrac{\left(2018-\dfrac{1}{4}\right)-\left(2019-\dfrac{3}{4}\right)}{\left(\dfrac{3}{4}-2019\right)+\left(2019-\dfrac{1}{4}\right)} = ?$

A) –1 B) –2 C) –3 D) –4 E) –5

13. $\dfrac{\left(\dfrac{3}{1001}-\dfrac{5}{1003}\right)-\left(\dfrac{5}{1003}+\dfrac{3}{1001}\right)}{\dfrac{5}{1003}} = ?$

A) –2 B) $-\frac{5}{1003}$ C) 0 D) $\frac{1003}{5}$ E) $\frac{10}{1003}$

14. $A = \left(\dfrac{1}{3}-1\right)\cdot\left(\dfrac{1}{4}-1\right)\cdots\left(\dfrac{1}{10}-1\right)$

$B = \left(1+\dfrac{1}{2}\right)\cdot\left(1+\dfrac{1}{3}\right)\cdots\left(1+\dfrac{1}{15}\right)$

$\Rightarrow \dfrac{B}{A} = ?$

A) –50 B) –40 C) –20 D) 20 E) 40

15. $1-\dfrac{3+\dfrac{1}{3+\dfrac{1}{3}}}{2+\dfrac{1}{2+\dfrac{1}{2}}} = ?$

A) $-\frac{3}{8}$ B) $-\frac{3}{4}$ C) 0 D) $\frac{1}{4}$ E) $\frac{1}{3}$

16. $\dfrac{33\frac{1}{2}-29\frac{1}{3}}{16\frac{2}{3}} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 2 E) 3

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	A	A	B	A	B	B	D
9	10	11	12	13	14	15	16
A	C	B	A	A	E	A	A

1. $\dfrac{2\frac{1}{2}}{\left(\frac{7}{2}-1\right):\left(2\frac{1}{2}-\frac{7}{4}\right)}=?$

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) $\frac{3}{4}$

2. $\left(\dfrac{2x-2}{3}-\dfrac{3}{4}\right)\cdot\dfrac{1}{6}=0 \Rightarrow x=?$

A) $\frac{13}{8}$ B) $\frac{15}{8}$ C) $\frac{17}{8}$ D) $\frac{19}{8}$ E) $\frac{21}{8}$

3. $\dfrac{1}{\frac{1}{x}-1}+\dfrac{2}{1-\frac{1}{x}}=2 \Rightarrow x=?$

A) 2 B) 3 C) 4 D) $\frac{1}{2}$ E) $\frac{1}{3}$

4. $3-\dfrac{1+\frac{1}{2}+\frac{1}{3}}{5+\frac{5}{2}+\frac{5}{3}}=?$

A) $\frac{9}{5}$ B) $\frac{12}{5}$ C) $\frac{14}{5}$ D) $\frac{16}{5}$ E) $\frac{18}{5}$

5. $\dfrac{1+\dfrac{1}{1+\frac{1}{2}}}{\frac{1}{4}+\frac{1}{6}}=?$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) 2 D) 3 E) 4

6. $\left(\dfrac{103+\frac{9}{4}}{105+\frac{1}{4}}\right)\cdot\left(\dfrac{99+\frac{5}{2}}{101+\frac{1}{2}}\right)=?$

A) 1 B) 2 C) 3 D) 4 E) 5

7. $\dfrac{1-\frac{1}{3}}{2-\frac{1}{2}}+\dfrac{x}{9}=1 \Rightarrow x=?$

A) 3 B) 4 C) 5 D) 6 E) 7

8. $2-\dfrac{1}{1+\dfrac{3}{1-\frac{1}{a}}}=\dfrac{1}{2} \Rightarrow a=?$

A) $\frac{1}{10}$ B) $\frac{7}{10}$ C) $\frac{9}{10}$ D) $\frac{11}{10}$ E) $\frac{13}{10}$

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9. $3+\dfrac{10}{2+\dfrac{6}{5-x}}=9 \Rightarrow$ **x = ?**

A) 22 B) 23 C) 24 D) 25 E) 26

10. $\dfrac{15}{4-\dfrac{1}{3-\dfrac{1}{x}}}-2=3 \Rightarrow$ **x = ?**

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 3

11. $6-\dfrac{2}{3+\dfrac{1}{2-\dfrac{1}{x}}}=5 \Rightarrow$ **x = ?**

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 2 E) 3

12. $2+\dfrac{8}{1+\dfrac{6}{4-x}}=6 \Rightarrow$ **x = ?**

A) –4 B) –2 C) 2 D) 4 E) 6

13. $\dfrac{2}{3+\dfrac{2}{\dfrac{4x}{9}}}=\dfrac{1}{6} \Rightarrow$ **x = ?**

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 3

14. $\mathbf{1-\dfrac{1}{1-\dfrac{1}{x+1}}=?}$

A) $-\frac{1}{x}$ B) –x C) x D) 1 E) $\frac{1}{x}$

15. $a, b, c, d \in Z^+$

$\dfrac{57}{10}=a+\dfrac{1}{b+\dfrac{1}{c+\dfrac{1}{d}}} \Rightarrow$ **a + b + c + d = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

16. $a, b, c \in Z^+$,

$\dfrac{27}{11}=a+\dfrac{1}{b+\dfrac{1}{c}} \Rightarrow$ **a + b + c = ?**

A) 7 B) 8 C) 9 D) 10 E) 11

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	C	A	C	E	A	C	A
9	10	11	12	13	14	15	16
B	B	B	B	B	A	B	C

1. $1-\dfrac{1}{1+\dfrac{1}{1+\dfrac{1}{3}}}=?$

A) 1 B) $\frac{6}{7}$ C) $\frac{5}{7}$ D) $\frac{4}{7}$ E) $\frac{3}{7}$

2. $\dfrac{1+\dfrac{1}{1+\dfrac{1}{4}}}{1-\dfrac{1}{4-\dfrac{1}{2}}}=?$

A) $\frac{18}{25}$ B) $\frac{27}{25}$ C) $\frac{9}{5}$ D) $\frac{54}{25}$ E) $\frac{63}{25}$

3. $\dfrac{3-\dfrac{1+\dfrac{1}{3}}{2}}{2+\dfrac{3+\dfrac{1}{3}}{3}}=?$

A) $-\frac{1}{8}$ B) $\frac{1}{8}$ C) $\frac{1}{4}$ D) $\frac{3}{4}$ E) 1

4. $1+\dfrac{1+\dfrac{2+\dfrac{1}{4}}{\dfrac{1}{4}}}{\dfrac{1}{4}}=?$

A) 41 B) 39 C) 35 D) 33 E) 29

5. $\dfrac{2+\dfrac{1-\dfrac{1}{1-\dfrac{1}{2}}}{1-\dfrac{1}{1+\dfrac{2}{3}}}}{}=?$

$2+\dfrac{1-\dfrac{1}{1-\dfrac{1}{2}}}{1-\dfrac{1}{1+\dfrac{2}{3}}}=?$

A) $\frac{3}{2}$ B) $\frac{2}{3}$ C) $-\frac{1}{3}$ D) $-\frac{1}{2}$ E) $-\frac{1}{6}$

6. $3-\dfrac{1}{2-\dfrac{1}{1-\dfrac{1}{3}}}=?$

A) 2 B) $\frac{4}{3}$ C) 1 D) $\frac{2}{3}$ E) $\frac{1}{2}$

7. $3-\dfrac{1}{1+\dfrac{3}{1-\dfrac{1}{2}}}=?$

A) $\frac{20}{7}$ B) $\frac{1}{6}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

8. $1-\dfrac{3+\dfrac{1}{3+\dfrac{1}{3}}}{2+\dfrac{1}{2+\dfrac{1}{2}}}=?$

A) $-\frac{3}{8}$ B) $-\frac{3}{4}$ C) 0 D) $\frac{1}{4}$ E) $\frac{1}{3}$

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9. $1-\dfrac{1}{1-\dfrac{2}{1-\dfrac{3}{2}}}=?$

A) $\frac{3}{4}$ B) $\frac{4}{5}$ C) $\frac{5}{6}$ D) $\frac{3}{5}$ E) $\frac{2}{3}$

10. $\dfrac{3}{8}-\dfrac{\dfrac{3}{4}}{1+\dfrac{1}{1-\dfrac{1}{2}}}=?$

A) $\frac{1}{8}$ B) $\frac{3}{8}$ C) $\frac{5}{8}$ D) $\frac{1}{4}$ E) $\frac{3}{4}$

11. $\dfrac{1-\dfrac{1}{2}}{1+\dfrac{1}{1+\dfrac{1}{2}}}=?$

A) $\frac{3}{5}$ B) $\frac{3}{10}$ C) $\frac{1}{5}$ D) $\frac{1}{10}$ E) $\frac{4}{15}$

12. $2-\dfrac{1}{1-\dfrac{1}{1+\dfrac{1}{3}}}\cdot\dfrac{1}{2}=?$

A) 0 B) 1 C) 2 D) 3 E) 4

13. $\frac{3}{4}+\frac{1}{5}+\frac{4}{7}=A$

$\Rightarrow \frac{1}{4}+\frac{4}{5}+\frac{3}{7}=?$

A) 1 – A B) 2 – A C) 3 – A D) A E) A – 3

14. $\frac{5}{6}+\frac{7}{10}+\frac{8}{11}=x \Rightarrow \frac{1}{6}+\frac{13}{10}+\frac{3}{11}=?$

A) 3 – x B) 4 – x C) 5 – x D) 6 – x E) 7 – x

15. $\frac{6}{7}-\frac{5}{6}+\frac{7}{8}=A \Rightarrow \frac{1}{7}-\frac{1}{6}+\frac{1}{8}=?$

A) 1 – A B) 2A – 1 C) 3 – A D) 4 + A E) 5 – 2A

16. $\frac{5}{8}-\frac{2}{7}+\frac{1}{6}-\frac{4}{5}=x$

$\Rightarrow \frac{3}{8}-\frac{5}{7}-\frac{1}{6}-\frac{1}{5}=?$

A) –x B) 1 – x C) x – 1 D) –1 – x E) 1 + x

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	E	D	A	D	C	A	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	A	B	A	C	B	A	C

1. $\frac{3}{5}+\frac{4}{7}+\frac{5}{9}=x$

$\Rightarrow \frac{2}{5}+\frac{3}{7}+\frac{4}{9}=?$

A) $x-1$ B) $2x$ C) $\frac{x}{3}$ D) $3-x$ E) $x-3$

2. $\frac{4}{9}+\frac{3}{7}+\frac{8}{11}=A$

$\Rightarrow \frac{13}{9}-\frac{4}{7}-\frac{3}{11}=?$

A) $1-A$ B) $2-A$ C) A D) $A-1$ E) $A-2$

3. $\frac{1}{3}+\frac{1}{5}+\frac{1}{7}=x$

$\Rightarrow \frac{1}{3}+\frac{3}{5}+\frac{5}{7}=?$

A) $3-x$ B) $1-x$ C) $3-2x$ D) $1-2x$ E) $-x+1$

4. $\frac{68}{72}+\frac{142}{73}+\frac{209}{71}=a$

$\Rightarrow \frac{1}{73}+\frac{1}{72}+\frac{1}{71}=?$

A) $\frac{4-a}{4}$ B) $\frac{5-a}{4}$ C) $\frac{6-a}{4}$ D) $\frac{4+a}{4}$ E) $\frac{6+a}{4}$

5. $\frac{2}{5}+\frac{3}{7}-\frac{1}{3}=x \Rightarrow \frac{1}{5}+\frac{1}{7}-\frac{1}{3}=?$

A) $1-x$ B) $1+x$ C) $1-2x$ D) $2x+1$ E) $2x-1$

6. $\frac{a}{b}+\frac{b}{c}+\frac{c}{d}=x$

$\Rightarrow \frac{a-b}{b}+\frac{b+c}{c}+\frac{c+d}{d}=?$

A) $x+3$ B) $x+1$ C) x D) $2x+1$ E) $2x$

7. $2+\cfrac{3}{2+\cfrac{3}{\vdots}}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $4+\cfrac{5}{4+\cfrac{5}{\vdots}}=x\ ,\ 3+\cfrac{4}{3+\cfrac{4}{\vdots}}=y \Rightarrow x+y=?$

A) 4 B) 5 C) 7 D) 9 E) 11

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9. $5+\cfrac{6}{1+\cfrac{6}{1+\cfrac{6}{\vdots}}}=?$

A) 6 B) 7 C) 8 D) 9 E) 10

10. $1-\cfrac{2}{1+\cfrac{2}{1+\cfrac{2}{1+\cfrac{2}{\vdots}}}}=?$

A) 0 B) 1 C) 2 D) 3 E) 4

11. $1+\cfrac{1}{-1+\cfrac{2}{-1+\cfrac{2}{\vdots}}}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

12. $A=1+\cfrac{30}{1+\cfrac{30}{1+\cfrac{30}{\vdots}}}$ $B=4-\cfrac{4}{4-\cfrac{4}{\vdots}}=?$

$\Rightarrow$ **A – B = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

13. $3-\cfrac{3-\cfrac{\vdots}{2}}{2}=?$

A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{2}$ D) 2 E) 3

14. $3+\cfrac{3+\cfrac{\vdots}{3}}{3}=?$

A) 2 B) $\frac{5}{2}$ C) 4 D) $\frac{9}{2}$ E) 5

15. $\cfrac{1+\cfrac{1+\cfrac{\vdots}{5}}{5}}{3+\cfrac{4}{3+\cfrac{4}{\vdots}}}=?$

A) $\frac{5}{2}$ B) 1 C) $\frac{5}{4}$ D) $\frac{5}{16}$ E) $\frac{5}{32}$

16. $5+\cfrac{x}{5+\cfrac{x}{5+\cfrac{x}{5+\cfrac{x}{\vdots}}}}=9 \Rightarrow$ **x = ?**

A) 32 B) 36 C) 42 D) 48 E) 52

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	D	C	C	C	B	C	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	A	B	D	D	D	D	B

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1. $x = 3 + \cfrac{4}{3 + \cfrac{4}{\vdots}}$, $y = 8 + \cfrac{9}{8 + \cfrac{9}{\vdots}}$ $\Rightarrow$ **y − x = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

2. $2x + \cfrac{12}{2x + \cfrac{12}{2x + \cfrac{12}{\vdots}}} = 4$ $\Rightarrow$ **4x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $x = \frac{3}{4}$, $y = \frac{2}{5}$, $z = \frac{1}{10}$ $\Rightarrow$ **? > ? > ?**

A) x > y > z B) x > z > y C) z > x > y D) y > x > z E) y > z > x

4. $\left.\begin{array}{l} a = \frac{2}{7} \\ b = \frac{3}{8} \\ c = \frac{6}{11} \end{array}\right\}$ $\Rightarrow$ **? > ? > ?**

A) a > b > c B) a > c > b C) c > a > b D) c > b > a E) b > a > c

5. $a = \frac{5}{6}$, $b = \frac{1}{3}$, $c = \frac{3}{4}$

$\Rightarrow$ **? > ? > ?**

A) a > c > b B) a > b > c C) c > b > a D) c > a > b E) b > a > c

6. $a = \frac{2}{11}$, $b = \frac{3}{20}$, $c = \frac{4}{21}$

$\Rightarrow$ **? > ? > ?**

A) c > b > a B) c > a > b C) b > a > c D) b > c > a E) a > b > c

7. $x = \frac{2}{5}$, $y = \frac{3}{7}$, $z = \frac{4}{11}$

$\Rightarrow$ **? < ? < ?**

A) x < y < z B) y < x < z C) z < x < y D) z < y < x E) x < z < y

8. $a = \frac{-7}{15}$, $b = \frac{-2}{5}$, $c = \frac{-1}{6}$ $\Rightarrow$ **? < ? < ?**

A) a < c < b B) a < b < c C) b < c < a D) c < b < a E) c < a < b

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9. $x = \frac{1001}{1000}$, $y = \frac{1003}{1002}$, $z = \frac{1004}{1003}$ $\Rightarrow$ **? > ? > ?**

A) x > y > z B) x > z > y C) z > x > y
D) y > x > z E) y > z > x

10. $a = \frac{117}{115}$, $b = \frac{119}{117}$, $c = \frac{121}{119}$ $\Rightarrow$ **? < ? < ?**

A) c < b < a B) b < c < a C) b < a < c
D) a < b < c E) a < c < b

11. $a = \frac{105}{103}$, $b = \frac{101}{99}$, $c = \frac{109}{107}$

$\Rightarrow$ **? > ? > ?**

A) b > a > c B) c > b > a C) b > c > a
D) c > a > b E) a > b > c

12. $a = \frac{73}{75}$, $b = \frac{75}{77}$, $c = \frac{77}{79}$

$\Rightarrow$ **? < ? < ?**

A) c < b < a B) b < c < a C) a < b < c
D) b < a < c E) a < c < b

13. $\left.\begin{array}{l} a \cdot b = \frac{6}{13} \\ a \cdot c = \frac{8}{15} \\ b \cdot c = \frac{4}{7} \end{array}\right\} \Rightarrow$ **? > ? > ?**

A) a > b > c B) c > a > b C) c > b > a
D) a > c > b E) b > a > c

14. $\left.\begin{array}{l} a + b = \frac{6}{11} \\ a + c = \frac{14}{13} \\ b + c = \frac{17}{18} \end{array}\right\} \Rightarrow$ **? > ? > ?**

A) a > b > c B) c > a > b C) c > b > a
D) a > c > b E) b > a > c

15. $x < y < z < 0$

$\left.\begin{array}{l} a = \frac{x}{y} \\ b = \frac{z}{y} \\ c = \frac{x}{z} \end{array}\right\} \Rightarrow$ **? < ? < ?**

A) a < b < c B) a < c < b C) b < a < c
D) b < c < a E) c < a < b

16. $x, y, z \in R^-$

$\frac{x+y}{4} = \frac{y+z}{5} = \frac{x+z}{7}$

$\Rightarrow$ **? > ? > ?**

A) y < x < z B) y < z < x C) x < y < z
D) x < z < y E) z < x < y

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	B	A	D	A	B	C	B
9	10	11	12	13	14	15	16
A	A	A	C	C	B	C	E

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1. 0,1 + 0,2 – 0,3 = ?

A) 0,1 B) 0,2 C) 0 D) –0,1 E) –0,2

2. $\frac{0,3}{3}+\frac{0,2}{2}-\frac{0,4}{4}=?$

A) 0,1 B) 0,2 C) 0,3 D) 0,4 E) 0,5

3. $\frac{2}{0,2}+\frac{1}{0,1}-\frac{3}{0,3}=?$

A) 0,1 B) 10 C) 0,3 D) $\frac{10}{3}$ E) 0,2

4. $\frac{0,99}{0,33}+\frac{0,44}{0,11}-\frac{0,4}{0,2}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

5. $\frac{2,3}{0,23}+\frac{0,4}{0,04}=?$

A) 10 B) 11 C) 20 D) 100 E) 101

6. $\frac{0,04}{0,008}+\frac{0,02}{0,004}-\frac{0,03}{0,005}=?$

A) –4 B) –2 C) 2 D) 4 E) 6

7. $\frac{1,2}{0,2}-\frac{1,2}{0,15}+\frac{1,6}{0,2}=?$

A) 14 B) 12 C) 8 D) 6 E) 4

8. $\frac{1}{3}+\frac{1}{0,3}+\frac{1}{0,03}=?$

A) 19 B) 23 C) 29 D) 31 E) 37

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9. $\frac{0,5}{0,01} \cdot 0,2 = ?$

A) 0,1 B) 10 C) 0,2 D) 20 E) 0,5

10. $10 - \frac{9}{10} + \frac{99}{100} = ?$

A) 9,91 B) 99,9 C) 99,1 D) 9,19 E) 10,09

11. $\frac{0,22}{4,4} + \frac{0,02}{5} = ?$

A) 0,1 B) 0,03 C) 0,64 D) 0,009 E) 0,054

12. $\frac{16,32}{0,8} - \frac{2}{0,5} = ?$

A) 6 B) 8 C) 12 D) 16,4 E) 18,2

13. $(0,9 - 0,3 : 0,1) : 3(0,3 - 1) = ?$

A) 0,1 B) 1 C) 0 D) –0,1 E) –1

14. $\frac{1,1}{12,1} - \frac{1}{1,1} = ?$

A) $\frac{11}{9}$ B) 1,1 C) $\frac{10}{11}$ D) $-\frac{9}{11}$ E) $\frac{9}{11}$

15. $\frac{0,8}{0,08} + \frac{2,5}{5} + \frac{3}{20} = ?$

A) 1,05 B) 1,75 C) 10,5 D) 10,65 E) 100,7

16. $\frac{0,125}{0,5} + \frac{0,27}{3} - \frac{99}{0,11} = ?$

A) 89,66 B) 89,67 C) –89,66 D) –89,67 E) 89,88

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1	2	3	4	5	6	7	8
C	A	B	E	C	D	D	E
9	10	11	12	13	14	15	16
B	E	E	D	B	D	D	C

1. $\frac{0,11}{0,1} - 0,4 : 0,4 = ?$

A) 0,1 B) 1,1 C) 0 D) 1 E) 2

2. $\frac{0,0016}{0,03} : \frac{0,04}{0,012} = ?$

A) 1,6 B) 0,16 C) 0,016 D) 0,12 E) 0,012

3. $0,005 \cdot (0,27 - 0,07) = ?$

A) 0,1 B) 0,01 C) 0,001 D) 0,2 E) 0,02

4. $\left(0,8 - 0,5 : 0,3 + \frac{5}{3}\right) \cdot \frac{2}{0,2} = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

5. $\frac{0,12}{0,3} + \frac{8}{0,02} + \frac{0,06}{0,002} = ?$

A) 430 B) 430,4 C) 432 D) 432,4 E) 450

6. $5 - \frac{7}{10} + \frac{71}{1000} = ?$

A) 5,001 B) 7,771 C) 4,229 D) 4,371 E) 4,971

7. $\frac{0,003}{0,3} + \frac{62,5}{6,25} - 0,01 = ?$

A) 100,1 B) 100 C) 10 D) 1 E) 0

8. $\frac{0,51}{1,7} + 0,64 : 32 + 1 = ?$

A) 1,32 B) 0,132 C) 10,2 D) 132 E) 11,2

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9. $\dfrac{4,68}{0,117}+\dfrac{10,4}{0,052}-\dfrac{9}{0,3}=?$

A) 195 B) 200 C) 205 D) 210 E) 215

10. $\dfrac{2+0,2}{1-0,8}-\dfrac{0,4-0,04}{0,36}=?$

A) 8 B) 10 C) 12 D) 14 E) 16

11. $\dfrac{0,32}{0,24}:\left(\dfrac{0,3}{0,02}\right)^{-1}=?$

A) 20 B) 10 C) 1 D) $\dfrac{2}{3}$ E) $\dfrac{1}{2}$

12. $\dfrac{1,32}{0,12}+\dfrac{0,3}{0,03}-\dfrac{1,8}{0,06}=?$

A) –9 B) –6 C) –3 D) 6 E) 9

13. $\dfrac{0,025}{0,25}+\dfrac{15}{0,02}-\dfrac{1,01}{0,1}=?$

A) 320 B) 340 C) 370 D) 720 E) 740

14. $\dfrac{a,bc+b,ca+c,ab}{10a+10b+10c}=?$

A) 0,001 B) 0,011 C) 0,111 D) 0,101 E) 0,1

15. $0,005-\dfrac{0,002}{4}=?$

A) 0,4998 B) 0,4989 C) 0,002 D) 0,045 E) 0,0045

16. $\dfrac{0,0008}{0,05}:\dfrac{0,02}{0,015}=?$

A) 1,2 B) 1,6 C) 0,08 D) 0,004 E) 0,012

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1	2	3	4	5	6	7	8
A	C	C	E	B	D	C	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	B	A	A	E	C	E	E

1. $\dfrac{0,03}{0,12}-\dfrac{0,003}{0,01}:\dfrac{0,12}{0,5}=?$

A) 3 B) 1 C) 0 D) −1 E) −2

2. $\dfrac{0,aa}{aa}-0,00b:0,b=?$

A) −1 B) −2 C) 0 D) 1 E) 2

3. $\dfrac{0,aaa}{aaa}\cdot\dfrac{0,b}{0,00b}\cdot\dfrac{0,c}{0,0c}=?$

A) 1 B) 0,1 C) 0,2 D) 2 E) 0,3

4. $\dfrac{0,5}{0,2+\dfrac{1}{\dfrac{1}{0,2}}}=?$

A) $\frac{3}{4}$ B) $\frac{5}{4}$ C) $\frac{7}{4}$ D) 1 E) $\frac{9}{4}$

5. $\dfrac{0,8}{0,4+\dfrac{1}{\dfrac{1}{0,2}}}=?$

A) 1 B) $\frac{4}{3}$ C) $\frac{3}{4}$ D) $\frac{1}{2}$ E) $\frac{8}{7}$

6. $1-\dfrac{0,1}{1-\dfrac{0,01}{0,02}}=?$

A) 0,4 B) 0,8 C) 1,4 D) 1,8 E) 2,4

7. $\dfrac{0,4}{0,032}+\dfrac{0,05}{0,0002}-\dfrac{3}{0,02}=?$

A) 0,1125 B) 1,125 C) 11,25 D) 112,5 E) 1125

8. $\dfrac{0,4}{0,004}+\dfrac{0,03}{0,3}+\dfrac{(0,2)^{-1}}{0,2}=?$

A) 1,251 B) 12,15 C) 125,1 D) 1251 E) 12510

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9. $\dfrac{(0,72)^2-(0,36)^2}{(0,38)^2-(0,02)^2}=?$

A) 0,27 B) 2,7 C) 27 D) 270 E) 2700

10. $\dfrac{0,21}{x}=\dfrac{1}{0,2}+\dfrac{1}{0,01} \Rightarrow x=?$

A) 0,2 B) 0,02 C) 0,002 D) 0,4 E) 0,04

11. $\dfrac{0,005\cdot 0,004}{0,02}=10^k \Rightarrow k=?$

A) –1 B) –2 C) –3 D) –4 E) –5

12. $\dfrac{0,27\cdot 10^3+50}{0,008\cdot 10^6}=?$

A) 0,4 B) 0,04 C) 0,004 D) 0,2 E) 0,02

13. $\dfrac{5\cdot 10^{-5}+0,04\cdot 10^{-3}+90\cdot 10^{-6}}{4,5\cdot 10^{-6}}=?$

A) 10 B) 20 C) 30 D) 40 E) 50

14. a, k ∈ Z,

$\dfrac{0,0016\cdot 0,0032}{0,64}=a\cdot 10^k \Rightarrow \min(a+k)=?$

A) 2 B) 3 C) 4 D) 5 E) 6

15. $\dfrac{0,125\cdot 10^5\cdot 0,8}{10^3}=?$

A) 0,001 B) 0,1 C) 1 D) 10 E) 100

16. $\dfrac{0,72\cdot 0,05\cdot 10^4}{10^2}=10^m\cdot 6^n \Rightarrow m+n=?$

A) –1 B) 0 C) 1 D) 2 E) 4

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1	2	3	4	5	6	7	8
D	C	A	B	B	B	D	C
9	10	11	12	13	14	15	16
B	C	C	B	D	A	D	C

1. $5,0\overline{5} = ?$

A) $\frac{91}{18}$ B) $\frac{92}{19}$ C) $\frac{93}{90}$ D) $\frac{94}{25}$ E) $\frac{18}{91}$

2. $0,2\overline{72} = ?$

A) $\frac{1}{11}$ B) $\frac{2}{11}$ C) $\frac{3}{11}$ D) $\frac{4}{11}$ E) $\frac{5}{11}$

3. $1,0\overline{12} = ?$

A) $\frac{167}{165}$ B) $\frac{169}{195}$ C) $\frac{1012}{99}$ D) $\frac{1013}{90}$ E) $\frac{1012}{89}$

4. $\frac{2,\overline{5}+1,\overline{4}}{1,\overline{9}} = ?$

A) 1 B) $\frac{3}{2}$ C) $\frac{4}{3}$ D) 2 E) $\frac{5}{2}$

5. $\frac{5,\overline{6}+3,\overline{3}}{2,\overline{8}} = ?$

A) $3\frac{3}{26}$ B) $4\frac{2}{13}$ C) $5\frac{5}{26}$ D) $\frac{9}{26}$ E) $\frac{1}{26}$

6. $0,\overline{6}+0,\overline{7}+0,\overline{8} = \frac{a+4}{a}$

$\Rightarrow$ a = ?

A) 3 B) 4 C) 5 D) 7 E) 9

7. $\left(0,\overline{2}+0,\overline{5}\right)\cdot\frac{9}{7} = ?$

A) 1 B) 2 C) 0,1 D) 0,2 E) 0,9

8. $\frac{0,\overline{4}+0,\overline{6}}{0,9} = ?$

A) 1 B) $\frac{1}{9}$ C) $\frac{1}{10}$ D) $\frac{81}{100}$ E) $\frac{100}{81}$

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9. $\frac{1}{9}+0,\overline{2}-0,\overline{6}=?$

A) $-\frac{1}{6}$ B) $-\frac{1}{3}$ C) $-\frac{1}{2}$ D) $\frac{1}{2}$ E) $\frac{1}{3}$

10. $\frac{0,\overline{9}}{0,\overline{3}}:\frac{0,\overline{6}}{0,\overline{7}}=?$

A) $\frac{1}{2}$ B) $\frac{3}{2}$ C) $\frac{5}{2}$ D) $\frac{7}{2}$ E) $\frac{9}{2}$

11. $\frac{1,\overline{2}+3,\overline{4}}{2,\overline{1}-1,\overline{2}}=?$

A) $\frac{17}{4}$ B) $\frac{19}{4}$ C) $\frac{21}{4}$ D) $\frac{23}{4}$ E) $\frac{25}{4}$

12. $\frac{2,\overline{2}-3,\overline{3}+4,\overline{4}-5,\overline{5}+6,\overline{6}-7,\overline{7}}{0,\overline{5}+2,\overline{4}}=?$

A) $-\frac{10}{9}$ B) $-\frac{8}{9}$ C) $\frac{8}{9}$ D) $\frac{10}{9}$ E) $\frac{14}{9}$

13. $\dfrac{1+\dfrac{1}{0,\overline{3}}}{2-\dfrac{1+0,2}{0,12}}+4=?$

A) 1 B) $\frac{2}{3}$ C) $\frac{7}{2}$ D) $\frac{5}{3}$ E) $\frac{7}{3}$

14. $\frac{5\cdot 0,3\overline{9}+3\cdot 0,1\overline{3}}{0,1\overline{6}}=?$

A) $\frac{18}{5}$ B) $\frac{32}{5}$ C) $\frac{48}{5}$ D) $\frac{64}{5}$ E) $\frac{72}{5}$

15. $\dfrac{0,1\overline{2}-\dfrac{1}{9}}{2-1,\overline{2}}=?$

A) $\frac{1}{30}$ B) $\frac{1}{35}$ C) $\frac{1}{70}$ D) $\frac{1}{90}$ E) $\frac{1}{120}$

16. $\dfrac{1+\dfrac{0,0\overline{3}}{1-\dfrac{1}{2}}}{1+0,\overline{2}}=?$

A) $\frac{27}{55}$ B) $\frac{11}{90}$ C) $\frac{7}{9}$ D) $\frac{9}{11}$ E) $\frac{48}{55}$

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1	2	3	4	5	6	7	8
A	C	A	D	A	A	A	E
9	10	11	12	13	14	15	16
B	D	C	A	C	E	C	E

1. $\dfrac{2,\overline{7}+1,\overline{6}}{\dfrac{10}{3}+\dfrac{10}{9}}=?$

A) 1 B) 2 C) $\dfrac{9}{10}$ D) $\dfrac{1}{3}$ E) $\dfrac{1}{11}$

2. $\dfrac{1,0\overline{6}+0,1\overline{3}}{1,\overline{36}}=?$

A) 0,6 B) 0,64 C) 0,88 D) 0,06 E) 0,96

3. $\left(\dfrac{-1}{\dfrac{2}{3}}\right)^{-1} : 0,\overline{6}=?$

A) –3 B) –2 C) –1 D) 1 E) 3

4. $\dfrac{0,1\overline{9}}{4}+\dfrac{0,3\overline{6}}{1,\overline{2}}=?$

A) $\dfrac{9}{10}$ B) 1 C) 2 D) $\dfrac{7}{20}$ E) $\dfrac{1}{90}$

5. $\dfrac{0,7\overline{9}+0,1\overline{9}+0,3\overline{9}}{\dfrac{1}{30}}=?$

A) 42 B) 30 C) 90 D) 9 E) 3

6. $\dfrac{\left(-2\dfrac{1}{3}\right) : \left(0,1\overline{5}\right)+3}{\left(0,\overline{3}\right)^{-1}}=?$

A) –6 B) –4 C) –3 D) 3 E) 4

7. $\left(2\dfrac{1}{3} : 0,\overline{3}+2\right) : \left(4-0,\overline{7} : \dfrac{28}{9}\right)=?$

A) 1,2 B) 1,4 C) 2,4 D) 3,2 E) 3,6

8. $\dfrac{0,\overline{27}-0,\overline{9}}{2-\dfrac{4}{11} : 2}=?$

A) $-\dfrac{3}{5}$ B) $-\dfrac{2}{5}$ C) $-\dfrac{1}{5}$ D) $\dfrac{1}{5}$ E) $\dfrac{2}{5}$

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9. $\dfrac{2}{3+\dfrac{2}{\dfrac{0,4}{x}}}=\dfrac{1}{6} \Rightarrow x=?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 2 D) 4 E) 6

10. $\dfrac{\dfrac{3}{2}+\left(\dfrac{2}{9}\right)^{-1}}{\left(0,\overline{3}+0,\overline{1}\right)^{-2}}=?$

A) $\frac{17}{32}$ B) $\frac{23}{32}$ C) $\frac{27}{32}$ D) $\frac{32}{17}$ E) $\frac{32}{27}$

11. $\dfrac{1}{0,1\overline{3}}+\dfrac{1}{0,2\overline{6}}=?$

A) $\frac{25}{4}$ B) $\frac{27}{4}$ C) $\frac{35}{4}$ D) $\frac{43}{4}$ E) $\frac{45}{4}$

12. $\dfrac{0,4}{x}=\dfrac{4,\overline{40}}{4,4} \Rightarrow x=?$

A) $\frac{44}{109}$ B) $\frac{44}{115}$ C) $\frac{22}{57}$ D) $\frac{22}{63}$ E) $\frac{33}{115}$

13. $\dfrac{a,0\overline{a}}{0,0\overline{a}}=?$

A) 89 B) 91 C) 96 D) 99 E) 101

14. $\dfrac{1,\overline{3}-1,3}{0,\overline{7}-0,\overline{6}}=?$

A) 0,1 B) 0,2 C) 0,3 D) 0,4 E) 0,5

15. $\left.\begin{array}{l} x=0,\overline{2} \\ y=0,0\overline{2} \end{array}\right\} \Rightarrow \dfrac{1}{x}+\dfrac{1}{y}=?$

A) 49 B) $\frac{99}{2}$ C) 50 D) $\frac{101}{2}$ E) 51

16. $a=0,\overline{3}$, $b=0,\overline{5}$

$\dfrac{1}{a}+\dfrac{1}{b}+\dfrac{1}{a\cdot b}=?$

A) 9 B) $\frac{47}{5}$ C) $\frac{49}{5}$ D) $\frac{51}{5}$ E) $\frac{53}{5}$

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1	2	3	4	5	6	7	8
A	C	C	D	A	B	C	B
9	10	11	12	13	14	15	16
C	E	E	A	B	C	B	D

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1. $\frac{x}{x+1} = 0,0\overline{3} \Rightarrow$ **x = ?**

A) 25 B) 29 C) $\frac{1}{29}$ D) $\frac{3}{29}$ E) $\frac{5}{29}$

2. $\frac{a,\overline{b} - b,\overline{a}}{16} = \frac{1}{18} \Rightarrow$ **a − b = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $0,\overline{1a} = 0,\overline{b2cd} \Rightarrow$ **a + b + c + d = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

4. **0,9 + 0,09 + 0,009 + ... = ?**

A) 1 B) 0,9 C) $\frac{10}{9}$ D) $\frac{1}{9}$ E) 0,1

5. x = 0,2 + 0,02 + 0,002 + ...

y = 0,5 + 0,05 + 0,005 + ... ⇒ **2x + y = ?**

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 1 E) 2

6. $\frac{3 - 0,6666...}{1 - 0,\overline{7}} = ?$

A) $\frac{15}{2}$ B) $\frac{17}{2}$ C) $\frac{19}{2}$ D) $\frac{21}{2}$ E) $\frac{23}{2}$

7. $\left.\begin{array}{l} x = 0,5454... \\ y = 0,3636... \end{array}\right\} \Rightarrow \frac{x+y}{x-y} = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

8. a = 1,555...

b = 1,333...

$\Rightarrow \frac{1}{a} + \frac{b}{2} = ?$

A) $\frac{55}{42}$ B) $\frac{47}{198}$ C) $\frac{67}{198}$ D) $\frac{113}{99}$ E) 1

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9. A = 0,6 + 0,06 + 0,006 + ...

B = 0,1 + 0,01 + 0,001 + ...

⇒ **A – B = ?**

A) 1 B) $\frac{1}{9}$ C) 0,9 D) $\frac{5}{9}$ E) 9

10. $\left.\begin{array}{l} A = \frac{3}{10} + \frac{3}{100} + \frac{3}{1000} + \ldots \\ B = \frac{4}{10} + \frac{4}{100} + \frac{4}{1000} + \ldots \end{array}\right\} \Rightarrow \mathbf{A + B = ?}$

A) $\frac{4}{9}$ B) $\frac{5}{9}$ C) $\frac{2}{3}$ D) $\frac{7}{9}$ E) $\frac{8}{9}$

11. $\left.\begin{array}{l} A = 2,2828\ldots \\ B = 1,1010\ldots \end{array}\right\} \Rightarrow \mathbf{\frac{A}{B} = ?}$

A) $\frac{226}{109}$ B) $\frac{224}{109}$ C) $\frac{222}{109}$ D) $\frac{220}{10}$ E) $\frac{218}{109}$

12. $\frac{0,636363\ldots}{0,1272727\ldots} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

13. $\frac{\mathbf{a,\overline{a}+b,\overline{b}}}{\mathbf{a0+b0}} = \mathbf{?}$

A) $\frac{1}{10}$ B) $\frac{1}{9}$ C) 1 D) 2 E) 9

14. $\frac{\mathbf{0,\overline{x}+0,\overline{xx}}}{\mathbf{x,\overline{x}+0,\overline{x}}} = \mathbf{?}$

A) $\frac{1}{6}$ B) $\frac{1}{9}$ C) $\frac{2}{9}$ D) $\frac{2}{11}$ E) $\frac{3}{11}$

15. $\frac{\mathbf{x,0\overline{x}+y,0\overline{y}}}{\mathbf{xy+yx}} \cdot \frac{\mathbf{11}}{\mathbf{91}} = \mathbf{?}$

A) 1 B) 11 C) $\frac{1}{90}$ D) 90 E) $\frac{1}{11}$

16. $\left.\begin{array}{l} m \neq 0, n \neq 0 \\ m + n = 6 \end{array}\right\} \Rightarrow \mathbf{m,\overline{nn}+n,\overline{mm} = ?}$

A) $\frac{14}{3}$ B) $\frac{16}{3}$ C) $\frac{17}{3}$ D) $\frac{19}{3}$ E) $\frac{20}{3}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	A	B	A	D	D	C	A
9	10	11	12	13	14	15	16
D	D	A	E	B	D	C	E

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1. $\dfrac{2-\dfrac{3}{4}}{1-\dfrac{3}{8}} = ?$

A) 2 B) $\dfrac{25}{32}$ C) $\dfrac{32}{25}$ D) 1 E) $\dfrac{13}{9}$

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

2. $\dfrac{33,33}{0,3+0,03} - \dfrac{20,2}{0,2} = ?$

A) 0 B) 1 C) 2 D) 200 E) 400

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

3. $\dfrac{17}{5} = a + \dfrac{1}{b+\dfrac{1}{c}} \Rightarrow a+b+c = ?$

A) 9 B) 3 C) 5 D) 7 E) 1

[FIRAT ÜNİVERSİTESİ – YÖS 2018]

4. $\dfrac{0,5}{0,05} + \dfrac{1,7}{0,17} - \dfrac{2,81}{0,281} = ?$

A) 1 B) 5 C) 10 D) 15 E) 20

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

5. $A = \dfrac{3}{29} + \dfrac{5}{32} + \dfrac{7}{39} \Rightarrow \dfrac{61}{29} + \dfrac{101}{32} + \dfrac{202}{39} = ?$

A) 10·A B) 10 + A C) 100 + A D) 100·A E) 9·A

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

6. $1 - \dfrac{2}{\dfrac{3}{5}} : \dfrac{\dfrac{2}{3}}{5} = ?$

A) –24 B) –14 C) 12 D) 18 E) 24

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

7. $\left[\dfrac{3-\dfrac{3}{5}}{2+\dfrac{1}{3}}\right] \cdot \left[\dfrac{4-\dfrac{1}{2}}{6-\dfrac{6}{5}}\right] = ?$

A) $\dfrac{3}{2}$ B) 1 C) $\dfrac{3}{4}$ D) $\dfrac{1}{2}$ E) $\dfrac{1}{3}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

8. a = 5, b = 2

$\Rightarrow \dfrac{0,03}{0,002} + \dfrac{0,1}{0,02} + \dfrac{0,03}{0,005} = ?$

A) a + b B) 2a + b C) 3a – b D) 4a + 3b E) 5a + 2b

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $\dfrac{2,5}{0,25}+\dfrac{0,2}{0,02}=?$

A) 10 B) 11 C) 20 D) 100 E) 101

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS-2017]

10. $\dfrac{3}{1-\dfrac{1}{3}}-3-\dfrac{\dfrac{1}{3}}{3}=?$

A) $-\dfrac{10}{9}$ B) $\dfrac{25}{18}$ C) $\dfrac{10}{9}$ D) $-\dfrac{19}{9}$ E) $\dfrac{17}{18}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

11. $\dfrac{(0,00005)^3}{(0,0025)^{-2}}=?$

A) $5^{-7}\cdot10^{19}$ B) $5\cdot10^{-7}$ C) $5^{-7}\cdot10^{-19}$ D) $5^{7}\cdot10^{-23}$ E) $5^{-7}\cdot10^{-23}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

12. $0,0003-\dfrac{0,001}{2}=?$

A) 0,4998 B) 0,4989 C) 0,002 D) –0,002 E) –0,0002

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

13. $\dfrac{1,\overline{3}-1,3}{0,\overline{7}-0,76}=?$

A) 3 B) 4 C) 5 D) 6 E) 7

[ERCİYES ÜNİVERSİTESİ – YÖS 2017]

14. $\dfrac{15-3\cdot7^{-1}}{4+8\cdot7^{-2}}=?$

A) $\dfrac{2}{7}$ B) $\dfrac{3}{7}$ C) $\dfrac{7}{4}$ D) $\dfrac{7}{3}$ E) $\dfrac{7}{2}$

[ERCİYES ÜNİVERİSİTESİ – YÖS 2017]

15. $a=\dfrac{13}{11},\ b=\dfrac{133}{131},\ c=\dfrac{1333}{1331}$

$\Rightarrow$? < ? < ?

A) a < c < b B) a < b < c C) b < c < a D) c < b < a E) c < a < b

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

16. $\dfrac{1}{4}+\left[\dfrac{1}{2}:\left(\dfrac{5}{6}-\dfrac{2}{3}\right)\right]=?$

A) $\dfrac{5}{2}$ B) $\dfrac{7}{4}$ C) $\dfrac{13}{4}$ D) $\dfrac{15}{4}$ E) 5

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	A	D	C	B	A	C	D
9	10	11	12	13	14	15	16
C	B	D	E	A	E	D	C

BÖLÜM CHAPTER 3

TARİHSEL NOT / HISTORICAL NOTE

Omar Khayyam [1048 – 1122]

Ömer Hayyam, anlaşılması güç matematiksel konuları, şiirsel bir dille açıklayan, derin felsefi bilgisi olan bir düşünür ve şairdir. O astronomik tablolar oluşturarak, yeni bir takvimin ortaya çıkmasına katkıda bulunmuştur. Ayrıca bir çemberin, bir parabol ile kesişiminden oluşan ve üçüncü dereceden denklemleri içeren problemleri çözerek yeni geometrik yöntemler de geliştirmiştir.

Omar Khayyam was a scholar who was a poet as well as a mathematician. He compiled astronomical tables and contributed to calendar reform and discovered a geometrical method of solving cubic equations by intersecting a parabola with a circle.

ÜSLÜ SAYILAR
EXPONENTIALS

Bu bölüm 128 alıştırma sorusu, 272 test sorusu, 16 YÖS sorusu içermektedir.

This chapter includes 128 exercise questions, 272 test questions, and 16 YÖS questions.

BÖLÜM / CHAPTER 3

ÜSLÜ SAYILAR / EXPONENTIALS

- Üslü Sayılar / Exponentials . . . . 121 - 174

BÖLÜM 03 CHAPTER

ÜSLÜ SAYILAR
EXPONENTIALS

Alıştırmalar / Exercises

Üslü Sayılar / Exponentials

1. $2^5 = ?$

Yanıt / The Answer is 32

2. $\left(-\frac{1}{3}\right)^4 = ?$

Yanıt / The Answer is $\frac{1}{81}$

3. $\left(\frac{3}{7}-\frac{2}{9}\right)^0 = ?$

Yanıt / The Answer is 1

4. $\left(\frac{1}{3}+\frac{1}{2}+\frac{1}{6}\right)^7 = ?$

Yanıt / The Answer is 1

5. $\left(\frac{-1}{4}\right)^{-2} = ?$

Yanıt / The Answer is 16

6. $\left(\frac{3}{4}\right)^{-3} = ?$

Yanıt / The Answer is $\frac{64}{27}$

7. $(2^3)^4 = ?$

Yanıt / The Answer is 2^{12}

8. $(3^{-2})^3 = ?$

Yanıt / The Answer is 3^{-6}

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9. $(x^{-3})^5 = ?$

Yanıt / The Answer is x^{-15}

10. $(8)^{-4} = ?$

Yanıt / The Answer is 2^{-12}

11. $\left[(3^{-2})^5\right]^{\frac{1}{10}} = ?$

Yanıt / The Answer is $\frac{1}{3}$

12. $\left[(7^3)^{-4}\right]^{-\frac{1}{6}} = ?$

Yanıt / The Answer is 49

13. $\left(-\frac{1}{27}\right)^{\frac{1}{3}} = ?$

Yanıt / The Answer is $-\frac{1}{3}$

14. $\left[(x^{-8})^3\right]^{\frac{1}{2}} = x^m \Rightarrow m = ?$

Yanıt / The Answer is –12

15. $\left[(a^5)^{-4}\right]^{\frac{1}{10}} = a^n \Rightarrow n = ?$

Yanıt / The Answer is –2

16. $\left[(81^{-4})^2\right]^{-1} = 3^x \Rightarrow x = ?$

Yanıt / The Answer is 32

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17. $[(32)^{-3}]^2 = 2^x \Rightarrow$ **x = ?**

Yanıt / The Answer is –30

18. $(-2)^{-2} + (-3)^{-1} - (6)^{-1} = ?$

Yanıt / The Answer is $\frac{-1}{4}$

19. $\left(-\frac{1}{2}\right)^4 + \left(-\frac{3}{4}\right)^2 - \left(-\frac{1}{2}\right)^3 = ?$

Yanıt / The Answer is $\frac{3}{4}$

20. $6x^2 - 4x^2 + 5x^2 = ?$

Yanıt / The Answer is $7x^2$

21. $2x^4 + \frac{1}{2}x^4 - x^4 = ?$

Yanıt / The Answer is $\frac{3x^4}{2}$

22. $5(x^4)^5 - 4(x^2)^{10} + 7(x^5)^4 = ?$

Yanıt / The Answer is $8 \cdot x^{20}$

23. $6 \cdot (2^4)^6 - 4 \cdot (2^3)^8 = ?$

Yanıt / The Answer is 2^{25}

24. $5^{x+2} = 125 \Rightarrow$ **x = ?**

Yanıt / The Answer is 1

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25. $4^{x+3} = 32 \Rightarrow x = ?$

Yanıt / The Answer is $-\frac{1}{2}$

26. $9^{x-5} = 27 \Rightarrow x = ?$

Yanıt / The Answer is $\frac{13}{2}$

27. $25^{5x+1} = 125 \Rightarrow x = ?$

Yanıt / The Answer is $\frac{1}{10}$

28. $16^{x+2} = 8^{2x-1} \Rightarrow x = ?$

Yanıt / The Answer is $\frac{11}{2}$

29. $2^x = m \Rightarrow 16^{x+1} = ?$

Yanıt / The Answer is $16 \cdot m^4$

30. $3^x = n \Rightarrow 27^{x-1} = ?$

Yanıt / The Answer is $\frac{n^3}{27}$

31. $5^x = a \Rightarrow 25^{x+1} = ?$

Yanıt / The Answer is $25 \cdot a^2$

32. $3^x = m \Rightarrow 9^{2x+1} = ?$

Yanıt / The Answer is $9 \cdot m^4$

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33. $2^x = a \Rightarrow 8^{2x-1} = ?$

Yanıt / The Answer is $\frac{a^6}{8}$

34. $3^x = a \Rightarrow 27^{x+2} = ?$

Yanıt / The Answer is $3^6 \cdot a^3$

35. $5^x = m \Rightarrow 125^{3x+1} = ?$

Yanıt / The Answer is $5^3 \cdot m^9$

36. $2^x = 3 \Rightarrow 2^{x+1} + 4^x = ?$

Yanıt / The Answer is 15

37. $5^x = 3 \Rightarrow 5^{2x} \cdot 3 + 125^x \cdot 2 = ?$

Yanıt / The Answer is 81

38. $3^x = 5 \Rightarrow 3^{2x} \cdot 5 + 27^x \cdot 2 = ?$

Yanıt / The Answer is 375

39. $5^x = 2 \Rightarrow 3 \cdot 25^x + 125^x = ?$

Yanıt / The Answer is 20

40. $2^x = 3 \Rightarrow 5 \cdot 4^x + 8^x = ?$

Yanıt / The Answer is 72

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41. $3^x = 5 \Rightarrow \dfrac{3^{x+2}-5}{9^x-3^x} = ?$

Yanıt / The Answer is 2

42. $2^4 \cdot 2^{-3} \cdot 2^5 = ?$

Yanıt / The Answer is 64

43. $3^4 \cdot 3^{-5} \cdot 3^2 = ?$

Yanıt / The Answer is 3

44. $5^6 \cdot 5^7 \cdot 5^{-10} = ?$

Yanıt / The Answer is 125

45. $(-3)^2 \cdot (3^{-1})^2 \cdot (-3^2)^3 \cdot (-3)^{-1} = ?$

Yanıt / The Answer is 3^5

46. $(-2^4)^3 \cdot (-2^3)^2 \cdot (-2^{-2})^4 = ?$

Yanıt / The Answer is -2^{10}

47. $\dfrac{2^9}{2^4} = ?$

Yanıt / The Answer is 32

48. $\dfrac{3^{-10}}{3^{-12}} = ?$

Yanıt / The Answer is 9

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49. $\dfrac{(-5)^{14}}{(-5)^{11}} = ?$

Yanıt / The Answer is –125

50. $2^{x+3}.2^{x-2}.2^{4-2x} = ?$

Yanıt / The Answer is 32

51. $3^{2x-3}.3^{3x-2}.3^{7-5x} = ?$

Yanıt / The Answer is 9

52. $5^{2x-y}.5^{x+y}.5^{2-3x} = ?$

Yanıt / The Answer is 25

53. $25^{2x-4}.5^{10-4x} = ?$

Yanıt / The Answer is 25

54. $(3^x)^4.(3^{-2})^{x+1}.9^{-x+2} = ?$

Yanıt / The Answer is 9

55. $\left(\frac{1}{4}\right)^{x+2}.2^{3x}.\left(\frac{1}{2}\right)^{x-3} = ?$

Yanıt / The Answer is $\frac{1}{2}$

56. $\dfrac{3^x+3^x+3^x+3^x}{3^x+3^x} = ?$

Yanıt / The Answer is 2

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57. $\dfrac{6^x+6^x}{2^x+2^x+2^x}=18 \Rightarrow x=?$

Yanıt / The Answer is 3

58. $\dfrac{9^x+9^x}{3^x+3^x+3^x}=54 \Rightarrow x=?$

Yanıt / The Answer is 4

59. $(-x^2)^2 \cdot (-x^3)^{-3} \cdot (-x^4)^3 = ?$

Yanıt / The Answer is x^7

60. $(-x^4)^{-1} \cdot (-x^2)^3 \cdot (-x^3)^5 = ?$

Yanıt / The Answer is $-x^{17}$

61. $\dfrac{5 \cdot 5^x + 3 \cdot 5^x - 4 \cdot 5^x}{5^x + 5^x} = ?$

Yanıt / The Answer is 2

62. $\dfrac{4 \cdot 10^x - 2 \cdot 10^x + 3 \cdot 10^x}{5 \cdot 10^x - 4 \cdot 10^x} = ?$

Yanıt / The Answer is 5

63. $\dfrac{x^{a-4b}}{x^{a+b}} = x^{-10} \Rightarrow b=?$

Yanıt / The Answer is 2

64. $\dfrac{4^6 \cdot 25^{-2}}{8^4 \cdot 5^{3x}} = 5^5 \Rightarrow x=?$

Yanıt / The Answer is –3

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65. $\dfrac{3^x \cdot 9^x \cdot 27^x}{3^{x-1} \cdot 9^{x-1}} = 3^{18} \Rightarrow$ **x = ?**

Yanıt / The Answer is 5

66. $\left(\frac{1}{3}\right)^{x-2} \cdot 3^{x-1} \cdot \left(\frac{1}{3}\right)^{4-x} = 9 \Rightarrow$ **x = ?**

Yanıt / The Answer is 5

67. $\left(\frac{2}{3}\right)^{x+1} \cdot \left(\frac{3}{2}\right)^{-x} \cdot \left(\frac{2}{3}\right)^{-3x+4} = \left(\frac{4}{6}\right)^{3} \Rightarrow$ **x = ?**

Yanıt / The Answer is 2

68. $\left(\frac{5}{2}\right)^{x+3} \cdot \left(\frac{2}{5}\right)^{x-2} \cdot \left(\frac{2}{5}\right)^{3-x} = \left(\frac{5}{2}\right)^{-3} \Rightarrow$ **x = ?**

Yanıt / The Answer is –5

69. $\left(\frac{1}{7}\right)^{x+4} \cdot \left(\frac{1}{7}\right)^{3-4x} \cdot (7)^{-2x} = 7^4 \Rightarrow$ **x = ?**

Yanıt / The Answer is 11

70. $2^x = m, \quad 3^x = n \quad \Rightarrow$ **72^x = ?**

Yanıt / The Answer is n^2m^3

71. $3^x = a, \quad 5^x = b \quad \Rightarrow$ **135^x = ?**

Yanıt / The Answer is a^3b

72. $2^x = a, \quad 3^x = b, \quad 5^x = c \quad \Rightarrow$ **180^x = ?**

Yanıt / The Answer is a^2b^2c

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73. $2^x = 3,\quad 2^y = 5 \quad \Rightarrow \quad 2^{2x-y+3} = ?$

Yanıt / The Answer is $\frac{72}{5}$

74. $\dfrac{2^n + 2^{n+2}}{2^{n-1}} = ?$

Yanıt / The Answer is 10

75. $\dfrac{5^n + 5^{n-1}}{5^{n+1}} = ?$

Yanıt / The Answer is $\frac{6}{25}$

76. $\dfrac{7^{2a+1} - 7^{2a}}{7^{2a+1}} = ?$

Yanıt / The Answer is $\frac{6}{7}$

77. $\dfrac{3^{a+2} + 3^a}{3^{a-1}} = ?$

Yanıt / The Answer is 30

78. $\dfrac{5^{x+2} - 5^{x+1} + 5^x}{5^x + 5^{x-1}} = ?$

Yanıt / The Answer is $\frac{35}{2}$

79. $\dfrac{2^{x+1} + 2^{x+2}}{2^x} = ?$

Yanıt / The Answer is 6

80. $\dfrac{3^{a+1} - 3^a}{3^{a-1}} = ?$

Yanıt / The Answer is 6

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81. $\dfrac{5^{x+1}-5^{x}}{5^{x+1}} : \dfrac{3^{x+2}-3^{x}}{3^{x+1}} = ?$

Yanıt / The Answer is $\dfrac{3}{10}$

82. $\dfrac{25 \cdot 5^{x-3}}{25^{x+2}} = 125 \Rightarrow x = ?$

Yanıt / The Answer is –8

83. $\dfrac{81 \cdot 3^{3x+2}}{9^{2x+1}} = \dfrac{1}{27} \Rightarrow x = ?$

Yanıt / The Answer is 7

84. $30^{x} = 4 \cdot 6^{x+1} \Rightarrow 5^{x+2} = ?$

Yanıt / The Answer is 600

85. $3^{x+4} = 6^{x+1} \Rightarrow 2^{x+4} = ?$

Yanıt / The Answer is 216

86. $10^{x} = 3 \cdot 5^{x+1} \Rightarrow 2^{x+1} = ?$

Yanıt / The Answer is 30

87. $15^{a+1} = 2 \cdot 3^{a+2} \Rightarrow 5^{a+2} = ?$

Yanıt / The Answer is 30

88. $2^{n+6} = 6^{n+2} \Rightarrow 3^{n-1} = ?$

Yanıt / The Answer is $\dfrac{16}{27}$

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89. $21^n = 2 \cdot 3^{n+2} \Rightarrow 7^{n+1} = ?$

Yanıt / The Answer is 126

90. $3^x + 3^{x+1} = 36 \Rightarrow x = ?$

Yanıt / The Answer is 2

91. $2^m + 2^{m+2} = 80 \Rightarrow m = ?$

Yanıt / The Answer is 4

92. $15^a = 3 \cdot 5^{a+2} \Rightarrow 3^{a+1} = ?$

Yanıt / The Answer is 225

93. $0{,}0005 = ?$

Yanıt / The Answer is $5 \cdot 10^{-4}$

94. $0{,}001 \cdot 10^{-4} = ?$

Yanıt / The Answer is 10^{-7}

95. $0{,}00016 \cdot 10^{8} = ?$

Yanıt / The Answer is $16 \cdot 10^{3}$

96. $0{,}25 \cdot 10^{-7} \cdot 0{,}002 \cdot 10^{6} = ?$

Yanıt / The Answer is $5 \cdot 10^{-5}$

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97. $\dfrac{4\cdot10^{-10}+0,02\cdot10^{-8}}{100\cdot10^{-12}}=?$

Yanıt / The Answer is 6

98. $\dfrac{0,06\cdot10^{-7}+0,4\cdot10^{-8}}{100\cdot10^{-10}}=?$

Yanıt / The Answer is 1

99. $\dfrac{10^{-12}+800\cdot10^{-14}}{3\cdot10^{-12}}=?$

Yanıt / The Answer is 3

100. $\dfrac{6\cdot10^{-12}\cdot0,04\cdot10^{-10}}{100\cdot10^{-26}}=?$

Yanıt / The Answer is 24

101. $\left(\dfrac{1,5}{0,5}\right)^{3x-2}=9^{x+3} \Rightarrow x=?$

Yanıt / The Answer is 8

102. $\left(\dfrac{3,5}{0,7}\right)^{2x-5}=125^{x+4} \Rightarrow x=?$

Yanıt / The Answer is –17

103. $6\cdot2^{x+2}+3^{x-1}=24\cdot2^{x}+81 \Rightarrow x=?$

Yanıt / The Answer is 5

104. $5\cdot3^{x-2}+2^{x+1}=\dfrac{5}{3}\cdot3^{x-1}+4^{x-2} \Rightarrow x=?$

Yanıt / The Answer is 5

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105. $2\cdot 3^x = \dfrac{9^{x+3}}{3^{2x+1}} - 3^4 \Rightarrow x = ?$

Yanıt / The Answer is 4

106. $5^x = \dfrac{(25)^{2x+1}}{5^{x-1}} \Rightarrow x = ?$

Yanıt / The Answer is $-\dfrac{3}{2}$

107. $\left.\begin{array}{r} 4^x = 3 \\ 8 = 9^y \end{array}\right\} \Rightarrow x \cdot y = ?$

Yanıt / The Answer is $\dfrac{3}{4}$

108. $\left.\begin{array}{r} (27)^x = 8 \\ 9 = (32)^y \end{array}\right\} \Rightarrow x \cdot y = ?$

Yanıt / The Answer is $\dfrac{2}{5}$

109. $\left.\begin{array}{r} 9^x = 8 \\ 27 = 4^y \end{array}\right\} \Rightarrow x \cdot y = ?$

Yanıt / The Answer is $\dfrac{9}{4}$

110. $\left.\begin{array}{r} 2^x = 125 \\ 2^y = 25 \end{array}\right\} \Rightarrow \dfrac{2x - y}{3x + y} = ?$

Yanıt / The Answer is $\dfrac{4}{11}$

111. $\left.\begin{array}{r} 3^x = 64 \\ 9^y = 32 \end{array}\right\} \Rightarrow \dfrac{2x + y}{x - y} = ?$

Yanıt / The Answer is $\dfrac{29}{7}$

112. $(x + 5)^5 = 13^5 \Rightarrow x = ?$

Yanıt / The Answer is 8

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113. $(7x - 1)^7 = (4x + 11)^7 \Rightarrow$ **x = ?**

Yanıt / The Answer is 4

114. $(3x + 5)^{13} = (2x - 7)^{13} \Rightarrow$ **x = ?**

Yanıt / The Answer is –12

115. $(4x - 3)^{1999} = (2x + 5)^{1999} \Rightarrow$ **x = ?**

Yanıt / The Answer is 4

116. $(x - 5)^2 = (2x - 1)^2 \Rightarrow$ **$\sum x = ?$**

Yanıt / The Answer is –2

117. $(3x - 1)^4 = (2x - 9)^4 \Rightarrow$ **$\sum x = ?$**

Yanıt / The Answer is –6

118. $(x + 7)^{2018} = (3x - 15)^{2018} \Rightarrow$ **$\sum x = ?$**

Yanıt / The Answer is 13

119. $(5x - 3)^{62} = (3x + 13)^{62} \Rightarrow$ **$\sum x = ?$**

Yanıt / The Answer is $\frac{27}{4}$

120. $x = 12^5$, $y = 11^5$, $z = 10^5$

$\Rightarrow$ **? < ? < ?**

Yanıt / The Answer is z < y < x

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121. $x = 3^{-5}$, $y = 3^{-6}$, $z = 3^{-7}$

$\Rightarrow$ **? < ? < ?**

Yanıt / The Answer is $z < y < x$

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122. $x = 3^{30}$, $y = 5^{20}$, $z = 2^{40}$

$\Rightarrow$ **? < ? < ?**

Yanıt / The Answer is $z < y < x$

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123. $x = 4^{30}$, $y = 3^{45}$, $z = 2^{75}$

$\Rightarrow$ **? < ? < ?**

Yanıt / The Answer is $x < y < z$

---

124. $x = 5^{-16}$, $y = 3^{-24}$, $z = 7^{-8}$

$\Rightarrow$ **? < ? < ?**

Yanıt / The Answer is $y < x < z$

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125. $\left.\begin{array}{l} 3^a = 25 \\ 5^b = 150 \\ 7^c = 14 \end{array}\right\} \Rightarrow$ **? < ? < ?**

Yanıt / The Answer is $c < a < b$

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126. $\left.\begin{array}{l} 5^x = 20 \\ 3^y = 1 \\ 6^z = 37 \end{array}\right\} \Rightarrow$ **? < ? < ?**

Yanıt / The Answer is $y < x < z$

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127. $\left.\begin{array}{l} x = 2^{45} \\ y = 5^{27} \\ z = 7^{18} \end{array}\right\} \Rightarrow$ **? < ? < ?**

Yanıt / The Answer is $x < z < y$

---

128. $\left.\begin{array}{l} a = 3^{72} \\ b = 5^{54} \\ c = 7^{36} \end{array}\right\} \Rightarrow$ **? < ? < ?**

Yanıt / The Answer is $b > a > c$

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1. $\dfrac{(-1)^2-(-2)^2-(-3)^3+1}{(-5)^2+(-2)^5+2}=?$

A) –5 B) –2 C) $-\frac{1}{2}$ D) $-\frac{1}{5}$ E) $-\frac{1}{3}$

2. $\dfrac{(-99)^0-(-5)^2-(-2)^5}{(-1)^8-(-1)^9-(1)^0}=?$

A) –8 B) $-\frac{1}{2}$ C) $\frac{1}{8}$ D) 2 E) 8

3. $(5^{-1}-2^{-2})^{-2}=?$

A) 100 B) 200 C) 300 D) 400 E) 500

4. $\left[2^0+\left(\frac{3}{2}\right)^{-1}\right]^{-2}=?$

A) $\frac{16}{25}$ B) $\frac{9}{25}$ C) $\frac{3}{25}$ D) $\frac{9}{5}$ E) $\frac{3}{5}$

5. $\left[\left(-\frac{1}{2}\right)^3\cdot\left(-\frac{1}{2}\right)^{-4}\cdot(-2)^2\right]^2=?$

A) $\frac{1}{64}$ B) $\frac{1}{32}$ C) 16 D) 32 E) 64

6. $\left(-\frac{2}{3}\right)-3\cdot(-2)^{-4}\cdot\left(-\frac{2}{3}\right)^2\cdot\left(-\frac{1}{2}\right)^{-5}=?$

A) –2 B) $-\frac{1}{2}$ C) $-\frac{1}{4}$ D) 2 E) 4

7. $(-2^4)^{-3}+(-2^{-2})^6+(2^{-1})^{12}=?$

A) 2^{-16} B) 2^{-14} C) 2^{-12} D) 2^{-10} E) 2^{-8}

8. $\dfrac{4^8+8^8}{2^8+4^8}=?$

A) 2^4 B) 2^5 C) 2^6 D) 2^7 E) 2^8

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9. $2^{x+1} + 2^{x+2} + 2^{x+3} = 112 \Rightarrow$ **x = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

10. $2^{x+4} - 2^{x+2} = 96 \Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

11. $2^x + 5^x + 7^x = 81$

$\Rightarrow \mathbf{6^x + 15^x + 21^x = ?}$

A) 3^{x+1} B) 3^{x+2} C) 3^{x+3} D) 3^{x+4} E) 3^{x+5}

12. $\left.\begin{array}{l} 2^x + 3^x + 4^x = a \\ 4^x + 6^x + 8^x = 16a \end{array}\right\} \Rightarrow$ **x = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

13. $\dfrac{2^{x+1} \cdot 4^x}{8^{x+1} \cdot 2^x} = 64 \Rightarrow$ **x = ?**

A) –8 B) –4 C) –2 D) 4 E) 8

14. $\mathbf{\dfrac{2 \cdot 6^{22} - 10 \cdot 6^{21}}{36^{10}} = ?}$

A) 8 B) 12 C) 16 D) 24 E) 32

15. $2^{2a} - 1 = 3 \Rightarrow \mathbf{\dfrac{12^a + 48^a}{3^a} = ?}$

A) 16 B) 18 C) 20 D) 22 E) 24

16. a, b ∈ N,

$4^8 + 16^4 + 64^3 + 2^{18} + 256^2 = a \cdot 2^b$

min(a) için (for) $\Rightarrow$ **a + b = ?**

A) 21 B) 24 C) 27 D) 32 E) 36

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	E	D	B	E	D	C	E
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
A	B	D	B	A	B	C	C

1. $16^0 + (-2)^3 - 1^2 + \left(\frac{1}{3}\right)^{-2} = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

2. $(-3)^2 - (-2)^3 + (-5^2) - (-4)^2 = ?$

A) –24 B) –12 C) –10 D) –6 E) –2

3. $\left(\frac{a^{-4} \cdot b^2}{a^{-1} \cdot b^{-4}}\right)^{\frac{1}{3}} = ?$

A) $\frac{1}{ab}$ B) $\frac{b^2}{a}$ C) $\frac{b}{a}$ D) $\frac{a^2}{b}$ E) ab^2

4. $x^y = -2 \Rightarrow \frac{x^{2y} - x^{3y}}{x^y} = ?$

A) –6 B) –2 C) –1 D) 1 E) 2

5. $4x^5 + 6x^5 - 8x^5 = 64 \Rightarrow x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

6. $\left.\begin{array}{l} x^m = x^7 \cdot y^{13} \\ y^m = x^{14} \cdot y^8 \end{array}\right\} \Rightarrow m = ?$

A) 16 B) 18 C) 19 D) 21 E) 24

7. $\frac{3^x + 6^x + 9^x}{5^x + 10^x + 15^x} = \frac{9}{25} \Rightarrow x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $\frac{2 \cdot 5^{x+1} + 5^{x-1} - 5^{x+2}}{5^{x-1}} = ?$

A) –80 B) –74 C) –70 D) –56 E) –40

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9. $(x + y - 4)^6 + (x - y + 10)^6 = 0 \Rightarrow$ **x·y = ?**

A) –24 B) –21 C) –10 D) –8 E) –4

10. $\dfrac{5^{20} - 5^{10}}{5^5 - 1} \cdot \dfrac{5^{-9}}{5^5 + 1} = ?$

A) $-\dfrac{1}{5}$ B) 5 C) 5^2 D) 5^3 E) 5^4

11. $\dfrac{0{,}7 \cdot 10^{-4} + 0{,}08 \cdot 10^{-3}}{1{,}5 \cdot 10^{-4}} = ?$

A) 0,01 B) 0,1 C) 1 D) 10 E) 15

12. $3^{x-1} = 2 \Rightarrow 3^{x+1} + 3^{x-1} - 3^{2x} = ?$

A) –32 B) –16 C) –8 D) 8 E) 16

13. $\dfrac{1}{3} \cdot 3^{a+1} + 9 \cdot 3^{a-1} - 27 \cdot 3^a - 3^a = x \cdot 3^{a+1} \Rightarrow$ **x = ?**

A) –16 B) –8 C) –4 D) 2 E) 8

14. $8^{a-4} = 32^a \Rightarrow 3^{a+3} = ?$

A) 243 B) 81 C) $\dfrac{1}{27}$ D) $\dfrac{1}{9}$ E) $\dfrac{1}{3}$

15. $\dfrac{1}{2 + 2^{a+1}} + \dfrac{1}{2 + 2^{1-a}} = ?$

A) $\dfrac{1}{4}$ B) $\dfrac{1}{2}$ C) 1 D) 2 E) 4

16. $\left.\begin{array}{l} a + b^{-1} = 4^{-1} \\ b + a^{-1} = 4 \end{array}\right\} \Rightarrow a^{-1} \cdot b = ?$

A) $\dfrac{1}{16}$ B) $\dfrac{1}{4}$ C) 1 D) 4 E) 16

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	A	B	A	B	D	B	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	B	C	B	B	C	B	E

1. $(-3)^2 + 1^{100} - 4^2 = ?$

A) 6 B) 3 C) 1 D) −3 E) −6

2. $(-3)^3 + (-4)^2 + 3^2 - (-2)^3 = ?$

A) 2 B) 4 C) 6 D) 9 E) 12

3. $1^{2018} + (-2)^3 + (2018)^0 = ?$

A) −4 B) −5 C) −6 D) −8 E) −10

4. $(x-4)^2 + (y+3)^2 = 0 \Rightarrow x \cdot y = ?$

A) −12 B) −6 C) 0 D) 6 E) 12

5. $\dfrac{4^4+4^4+4^4+4^4}{16} = ?$

A) 1 B) 4 C) 16 D) 64 E) 128

6. $2^x + 2^x + 2^x + 2^x = 128 \Rightarrow x = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

7. $\dfrac{3^{2x} \cdot 9}{3^{x-1}} = 81 \Rightarrow x = ?$

A) 5 B) 4 C) 3 D) 2 E) 1

8. $4 \cdot 2^x + 2 \cdot 2^x + 3 \cdot 2^x = 72 \Rightarrow x = ?$

A) 1 B) 3 C) 5 D) 7 E) 9

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9. $3^{x+1} + 3^{x+3} + 3^{x+4} = 111 \Rightarrow$ **x = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

10. $\dfrac{5^{x+2} + 5^{x+3} + 5^{x+4}}{5^{x} + 5^{x+1} + 5^{x+2}} = ?$

A) 0 B) 5 C) 15 D) 25 E) 50

11. $\dfrac{9^4 + 9^4 + 9^4 + 9^4 + 9^4 + 9^4}{3^3 + 3^3} = ?$

A) 3^3 B) 3^4 C) 3^6 D) 3^8 E) 3^{10}

12. $\left.\begin{array}{l} 2^x = a \\ 3^x = b \end{array}\right\} \Rightarrow 6^x = ?$

A) ab B) 2ab C) 3ab D) $\dfrac{ab}{2}$ E) $\dfrac{ab}{3}$

13. $\left.\begin{array}{l} 2^a = m \\ 5^a = n \end{array}\right\} \Rightarrow 20^a = ?$

A) 2mn B) m^2n C) mn^2 D) m^2n^3 E) mn

14. $\dfrac{15^x + 15^x + 15^x}{5^x + 5^x} = 27 \Rightarrow 3^x = ?$

A) 3 B) 9 C) 18 D) 27 E) 36

15. $5^{x+1} = m \Rightarrow 5^{x-1} = ?$

A) m B) $\dfrac{m}{5}$ C) $\dfrac{m}{20}$ D) $\dfrac{m}{25}$ E) $\dfrac{m}{125}$

16. $15^{x+1} = 5^{x+2} \Rightarrow 3^x = ?$

A) $\dfrac{2}{5}$ B) $\dfrac{3}{5}$ C) $\dfrac{5}{2}$ D) $\dfrac{5}{3}$ E) $\dfrac{5}{4}$

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1	2	3	4	5	6	7	8
E	C	C	A	D	C	E	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	D	C	A	B	C	D	D

1. $\dfrac{\left(-\frac{1}{2}\right)^3 \cdot \left(-2^4\right)}{(-2)^4 \cdot (4)^{-1}} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) -2 E) -4

2. $\dfrac{(-1)^{1881} - 1^{1938} - (-1)^{1955}}{1^{1923} - (3)^{-1}} = ?$

A) -1 B) $-\frac{1}{2}$ C) $-\frac{3}{2}$ D) $\frac{1}{2}$ E) $\frac{3}{2}$

3. $\left(3^{-1} - 7^0\right)^{-2} \cdot \left(\frac{3}{4}\right)^{-3} = ?$

A) $\frac{2}{3}$ B) $\frac{4}{9}$ C) $\frac{8}{3}$ D) $\frac{16}{3}$ E) $\frac{8}{9}$

4. $\dfrac{\left(-a^4\right) \cdot (a)^{-3} \cdot (-a)^{-6}}{\left(-a^{-1}\right)^5 \cdot (-a)^{-3}} = ?$

A) $-a^3$ B) $-a$ C) a^{-3} D) a^{-5} E) a^{-9}

5. $\dfrac{(-3)^{-2} \cdot \left(-3^6\right) \cdot (-3)^{-3}}{3^{-1}} = ?$

A) $\frac{1}{9}$ B) $\frac{1}{3}$ C) 3 D) 9 E) 24

6. $\dfrac{(125)^3 \cdot 12^2}{10^5 \cdot 15^3} = ?$

A) $\frac{5}{6}$ B) $\frac{5}{12}$ C) $\frac{10}{3}$ D) $\frac{15}{2}$ E) $\frac{25}{6}$

7. $\dfrac{8^{2x+1}}{4^{3x-1}} = ?$

A) 2 B) 4 C) 8 D) 16 E) 32

8. $2^{x-1} \cdot 3^{x+1} = A \Rightarrow 6^{x-2} = ?$

A) $\frac{A}{54}$ B) $\frac{A}{36}$ C) $\frac{A}{12}$ D) 12A E) 36A

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9. $2^{x-2} = a \Rightarrow \mathbf{8^{x-2} = ?}$

A) a B) a^3 C) 2a D) $2a^3$ E) $8a^3$

10. $5^{x-1} = 2 \Rightarrow \mathbf{25^{x+1} = ?}$

A) 25 B) 125 C) 225 D) 625 E) 2500

11. $\dfrac{3^{x+1}+3^x}{6\cdot 3^{x-2}} + \dfrac{5^x-5^{x-1}}{5^{x-2}} = ?$

A) 24 B) 26 C) 27 D) 32 E) 36

12. $1 + 3 + 3^2 + ... + 3^{16} = x \Rightarrow \mathbf{3^3 + 3^4 + ... + 3^{19}}$

A) 9x B) 27x C) 81x D) 243x E) 276x

13. $\dfrac{12^{x-1}}{2^{4-2x}} = \dfrac{3^{x+2}}{27} \Rightarrow \mathbf{x = ?}$

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

14. $\dfrac{5^{x-2}}{2^y \cdot 3^y} = \dfrac{30}{6^{y+1}} \Rightarrow \mathbf{x = ?}$

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

15. $\dfrac{0,3\cdot 10^{-5} + 0,05\cdot 10^{-4}}{16\cdot 10^{-6}} = ?$

A) 2^{-2} B) 2^{-1} C) 2 D) 2^2 E) 2^3

16. $x \in R$,
$(x^2+2)^{x^2-2x} = 1 \Rightarrow \sum x = ?$

A) −2 B) −1 C) 0 D) 1 E) 2

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	C	D	A	D	A	E	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	E	B	B	C	E	B	E

1. $\left(\frac{1}{8}\right)^{-\frac{1}{3}} = ?$

A) –0,1 B) 0,5 C) 1 D) 2 E) 10

2. $(-x^{-1})^{-2} \cdot (-x^{-2})^{-1} \cdot (-x^{3})^{-1} = ?$

A) –1 B) 1 C) x^{-1} D) x E) x^2

3. $3^{(2^3)} = k \cdot (3^2)^3 \Rightarrow k = ?$

A) $\frac{1}{9}$ B) 1 C) 2 D) 3 E) 9

4. $A = \frac{2^x + 2^x + 2^x}{6^x + 6^x + 6^x} \Rightarrow A = ?$

A) 2^{-x} B) 3^{-x} C) 1 D) 2^x E) 3^x

5. $3^{-1} \cdot 3^{2} \cdot 3^{-3} \cdot 3^{4} \cdot \ldots \cdot 3^{-19} \cdot 3^{20} = ?$

A) 3^5 B) 3^8 C) 3^{10} D) 3^{12} E) 3^{15}

6. $7^{-x} = 2 \Rightarrow 7^{x+1} = ?$

A) 1,5 B) 2,5 C) 3, 5 D) 4, 5 E) 5, 5

7. $\frac{3^{a+3} - 3^{a+2}}{3^{a+4} - 3^{a+2}} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 2 E) 4

8. $\frac{3^n + 3^n + 3^n}{5^n + 5^n + 5^n + 5^n + 5^n} = \left(\frac{5}{3}\right)^{\frac{1}{3}} \Rightarrow n = ?$

A) $-\frac{4}{3}$ B) $-\frac{3}{4}$ C) $-\frac{2}{5}$ D) $\frac{4}{5}$ E) $\frac{3}{4}$

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9. $3^{x-3} = m \Rightarrow \mathbf{3^{2-x} = ?}$

A) $\frac{3}{m}$ B) 3m C) $\frac{1}{9m}$ D) $\frac{1}{3m}$ E) 9m

10. $6^{1-\frac{1}{a}} = 3 \Rightarrow \mathbf{2^a = ?}$

A) 6 B) 3 C) 2 D) $\frac{3}{2}$ E) 1

11. $(2x-1)^{16} = (x+2)^{16} \Rightarrow \prod \mathbf{x = ?}$

A) –3 B) –2 C) –1 D) 1 E) 3

12. $(a-1)^{a-1} = 1 \Rightarrow \sum \mathbf{a = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

13. $\left(\frac{x^x}{y^y}\right)^{a-b} \cdot \left(\frac{y^y}{x^{x+y}}\right)^{a-b} \mathbf{= ?}$

A) 1 B) x^y C) x^{a-b} D) x^{a-by} E) x^{yb-ya}

14. $m, n \in N^+$,

$x^{2m} = y^5$,

$x^{3n} = y$,

$m \cdot n = 30 \Rightarrow \mathbf{m + n = ?}$

A) 19 B) 17 C) 7 D) 3 E) 1

15. $x > 0$,

$$\left.\begin{array}{l} x^{a+b} = 9 \\ x^{a-b} = 4 \end{array}\right\} \Rightarrow \mathbf{x^a + x^b = ?}$$

A) $\frac{13}{2}$ B) $\frac{15}{2}$ C) $\frac{17}{2}$ D) $\frac{19}{2}$ E) $\frac{21}{2}$

16.

$$\left.\begin{array}{l} x^a \cdot y^a = 3 \\ \frac{x^a}{y^a} = 3 \end{array}\right\} \Rightarrow \mathbf{x^a - y^a = ?}$$

A) –3 B) 0 C) 1 D) 2 E) 3

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1	2	3	4	5	6	7	8
D	D	E	B	C	C	A	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	A	C	B	E	B	B	D

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1. $\dfrac{(-a)^8\cdot(-a)^{-4}\cdot(-a^2)^3}{-a^4\cdot a^5} = ?$

A) $-\dfrac{1}{a}$ B) $-a$ C) 1 D) a E) a^2

2. $\dfrac{(-a)^3\cdot(-a^6)\cdot(-a^{-4})}{(-a^{-2})^{-3}\cdot(a^3)^{-1}} = ?$

A) $-a^6$ B) $-a^4$ C) $-a^2$ D) a^2 E) a^4

3. $\dfrac{(-1905)^0+1917^0}{(-1923)+(1929)} = ?$

A) $\dfrac{1}{6}$ B) $\dfrac{1}{4}$ C) $\dfrac{1}{3}$ D) $\dfrac{1}{2}$ E) 1

4. $\dfrac{125^{\frac{1}{3}}+49^{\frac{1}{2}}}{\left(\frac{1}{2}\right)^{-3}+2^4} = ?$

A) $\dfrac{1}{4}$ B) $\dfrac{1}{2}$ C) 1 D) 2 E) 4

5. $\dfrac{\left(-\frac{1}{3}\right)^4(27)^{-2}(81)^4}{(-3^2)^3\cdot(-3^{-7})} = ?$

A) -3^2 B) -3 C) 3^4 D) 3^5 E) 3^7

6. $5^x = 3^y \Rightarrow 5^{\frac{x}{y}} + 3^{\frac{y}{x}} = ?$

A) 2 B) 3 C) 5 D) 8 E) 10

7. $\left.\begin{array}{l}3^x = 5\\ 5^y = 10\\ 10^z = 16\end{array}\right\} \Rightarrow 3^{xyz} = ?$

A) 5 B) 7 C) 9 D) 12 E) 16

8. $x > 0$,

$\dfrac{x^{2a}-4}{x^a+2} : \dfrac{x^a-2}{x^4} = (0,2)^{-4} \Rightarrow x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $(7x-12)^7 = (5x-2)^7 \Rightarrow \sum x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

10. $(2x-9)^6 = (x-3)^6 \Rightarrow \sum x = ?$

A) 7 B) 8 C) 9 D) 10 E) 11

11. $a^{x-1} = b^x \Rightarrow \left(\frac{b}{a}\right)^{3-2x} = ?$

A) $\frac{b}{a}$ B) $a^{-1}b^3$ C) $a^{-2}b^2$ D) $\frac{b^3}{a^2}$ E) a^2b^{-2}

12. $(2x-5)^{x^2-4} = 1 \Rightarrow \sum x = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

13. $\left.\begin{array}{l} x^a = 8 \\ 16^a = x^2 \end{array}\right\} \Rightarrow 4a^2 + 2 = ?$

A) 2 B) 4 C) 6 D) 8 E) 10

14. $\left.\begin{array}{l} 25^x = 4^y \\ 5^{x-1} = 2^{y+1} \end{array}\right\} \Rightarrow x = ?$

A) $-y$ B) $-\frac{1}{y}$ C) y D) $y+1$ E) $2y$

15. $\left.\begin{array}{l} 3^x = 4 \\ 3^y = 100 \end{array}\right\} \Rightarrow 0{,}2 = ?$

A) 3^{y-x} B) -2^{x-y} C) $3^{\frac{x-y}{2}}$ D) 3^{x+y} E) $3^{\frac{x-y}{4}}$

16. $\left.\begin{array}{l} a^{x-y} = 81 \\ a^{x+y} = 27 \end{array}\right\} \Rightarrow \frac{x}{y} = ?$

A) –7 B) –5 C) 5 D) 7 E) 9

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1	2	3	4	5	6	7	8
D	D	C	B	E	D	E	E
9	10	11	12	13	14	15	16
E	D	B	B	D	A	C	A

1. $a, b \in N^+$,
$16^{2a} = 64^{3b} \Rightarrow$ **min(a+b) = ?**

A) 12 B) 13 C) 15 D) 17 E) 21

2. $2 \cdot 3^{x+1} - 6 \cdot 3^x + 5 \cdot 3^{x-2} = 405$
$\Rightarrow$ **x = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

3. $\left(\frac{4}{25}\right)^a \cdot \left(\frac{5}{2}\right)^{a+1} = 6,25 \Rightarrow$ **a = ?**

A) –2 B) –1 C) 1 D) 2 E) 3

4. $\frac{3^a - 2}{3^a} = \frac{1}{3} \Rightarrow$ $\mathbf{4^{a+2} = ?}$

A) 16 B) 32 C) 48 D) 64 E) 72

5. $\frac{3}{3^{1-x}} = y \Rightarrow$ $\mathbf{9^{x+1} = ?}$

A) 3y B) $3y^2$ C) 9y D) $9y^2$ E) $12y^2$

6. $3^{a-2} = x \Rightarrow$ $\mathbf{3^{3-a} = ?}$

A) $\frac{1}{x}$ B) $\frac{2}{x}$ C) $\frac{3}{x}$ D) $\frac{x}{2}$ E) $\frac{x}{3}$

7. $5^x = b \Rightarrow$ $\mathbf{b^3 \cdot 5^{2-3x} = ?}$

A) 5 B) 25 C) 50 D) 75 E) 125

8. $\frac{3^x + 3^x + 3^x}{3^x \cdot 3^x} = \frac{1}{81} \Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

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9. $36^{x-1} = 4 \Rightarrow \mathbf{6^x = ?}$

A) 12 B) 14 C) 16 D) 18 E) 20

10. $8^{x+2} = 27 \Rightarrow \mathbf{2^{2x+6} = ?}$

A) 12 B) 18 C) 24 D) 36 E) 48

11. $(b^x)^y = b^x \cdot b^y \Rightarrow \mathbf{y = ?}$

A) $\frac{1}{x-1}$ B) $\frac{x-1}{x}$ C) $\frac{x}{x-1}$ D) $\frac{1}{x}$ E) $\frac{x}{x+1}$

12. $27^{1-2a} \cdot 9^a = 243^{-1} \Rightarrow \mathbf{a = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

13. $7^{a+1} = 28^{a-1} \Rightarrow \mathbf{2^a = ?}$

A) 7 B) 9 C) 12 D) 14 E) 21

14. $10^a = 2^{a+1} \Rightarrow \mathbf{5^{2a+1} = ?}$

A) 20 B) 32 C) 40 D) 52 E) 60

15. $9^x = 4 \Rightarrow \mathbf{3^x + 27^{x+1} = ?}$

A) 72 B) 108 C) 144 D) 196 E) 218

16. $\frac{1}{3^{x+3}} = 6 \Rightarrow \mathbf{? < x < ?}$

A) $-5 < x < -4$ B) $-4 < x < -3$ C) $-3 < x < -2$
D) $-2 < x < -1$ E) $-1 < x < 0$

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1	2	3	4	5	6	7	8
B	C	B	D	D	C	B	D
9	10	11	12	13	14	15	16
A	D	C	B	D	A	E	A

1. $\dfrac{(-a)^6 \cdot (-a^4) \cdot (-a^2)^3}{(-a)^{10}} = ?$

A) $-a^6$ B) $-a^{-4}$ C) a^4 D) a^6 E) a^{10}

2. $5^{2x-1} = 125^{x+4} \Rightarrow$ **x = ?**

A) −13 B) −9 C) −5 D) 5 E) 9

3. $3^x = A \Rightarrow$ **81^{x+1} = ?**

A) A^4 B) $3A^4$ C) $9A^4$ D) $27A^4$ E) $81A^4$

4. $5^x + 2 \cdot 5^x + 5^{x+2} = 700 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

5. $2^{x+3} \cdot 2^{x-2} \cdot 2^{2x-4} = 32 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

6. $2^x = a,\ 3^x = b,\ 5^x = c \Rightarrow$ **$18 \cdot (90)^{x-1}$ = ?**

A) $\dfrac{abc}{5}$ B) $\dfrac{ab^2c}{4}$ C) $\dfrac{ab^2c}{5}$ D) $\dfrac{a^2bc}{4}$ E) $\dfrac{a^2bc}{5}$

7. $2^x = a,\ 3^x = b,\ 5^x = c \Rightarrow$ **$(14,4)^x$ = ?**

A) $\dfrac{a^3b^2}{c}$ B) $\dfrac{a^2b^3}{c}$ C) $\dfrac{ab^2}{c}$ D) $\dfrac{a^4b^2}{c}$ E) $\dfrac{a^3b}{c}$

8. $\dfrac{4^{3x-2y+1}}{8^{2x-y}} = 16 \Rightarrow$ **y = ?**

A) −4 B) −2 C) 2 D) 4 E) 6

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9. $x, y, m \in Z^+$,

$$\frac{9^{10}+9^{10}+9^{10}+9^{10}}{3^7+3^7} = x \cdot y^m \Rightarrow \min(x+y+m) = ?$$

A) 13 B) 14 C) 16 D) 17 E) 18

10. $\left(\frac{11}{2}\right)^{x-11} = \left(0,\overline{18}\right)^{3x-5} \Rightarrow x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

11. $(5x-4)^5 = (2x+23)^5 \Rightarrow x = ?$

A) 3 B) 5 C) 6 D) 9 E) 12

12. $(2x+5)^4 = (3x-25)^4 \Rightarrow \sum x = ?$

A) 26 B) 30 C) 34 D) 38 E) 40

13. $(x-5)^{x+3} = 1 \Rightarrow \sum x = ?$

A) 3 B) 6 C) 7 D) 10 E) 13

14. $(x-3)^{x+5} = 1 \Rightarrow \sum x = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

15. $(x-2)^{x^2-4} = 1 \Rightarrow \sum x = ?$

A) –2 B) –1 C) 1 D) 2 E) 4

16. $\left.\begin{array}{l} 3^{m-1} = x^3 \\ 3^{m+2} = x^2 \end{array}\right\} \Rightarrow m = ?$

A) –8 B) –6 C) –4 D) 6 E) 8

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1	2	3	4	5	6	7	8
D	A	E	B	B	C	A	B
9	10	11	12	13	14	15	16
E	D	C	C	A	B	C	A

1. $-(-2)^3 - (2)^4 + (-2)^2 = ?$

A) 12 B) 20 C) –12 D) –4 E) 8

2. $-\left(\frac{2}{3}\right)^2 : \left(-\frac{2}{3}\right)^4 = ?$

A) $-\frac{3}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{2}$ D) $-\frac{27}{8}$ E) $-\frac{9}{4}$

3. $32^x = \left(\frac{1}{16}\right)^2 \Rightarrow x = ?$

A) –2 B) $-\frac{8}{5}$ C) $\frac{1}{2}$ D) $\frac{3}{2}$ E) 2

4. $\left.\begin{array}{l} x^a = 64 \\ x^b = 4 \end{array}\right\} \Rightarrow \frac{a}{b} = ?$

A) 1 B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) 2 E) 3

5. $\frac{3^x + 3^x + 3^x + 3^x}{6^x + 6^x + 6^x} = \frac{64}{3} \Rightarrow x = ?$

A) 3 B) 2 C) 0 D) –2 E) –4

6. $3^x + 2 \cdot 3^{x-1} - 9 \cdot 3^{x-2} = 162 \Rightarrow x = ?$

A) 6 B) 5 C) 4 D) 2 E) 1

7. $3^{2x} = 4 \Rightarrow 3^{4x+3} = ?$

A) 396 B) 408 C) 416 D) 432 E) 440

8. $(0,2)^{x-3} = 25^x \Rightarrow x = ?$

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) 2

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9. $\dfrac{-4^2 : (0,04)^2}{2^{x-3}} = -(800)^2 \Rightarrow$ **x = ?**

A) –3 B) 1 C) 0 D) 7 E) 9

10. $\dfrac{2 \cdot 4^{3x+1}}{8^x} = \left(\dfrac{1}{16}\right)^3 \Rightarrow$ **x = ?**

A) –9 B) –5 C) 0 D) 3 E) 12

11. $\dfrac{2 \cdot 10^x}{480 \cdot 10^3} = \dfrac{1}{2,4 \cdot 10^{-3}} \Rightarrow$ **x = ?**

A) 8 B) 7 C) 6 D) 5 E) 4

12. $\left.\begin{array}{l} 2^{a-1} = x \\ 5^{a+2} = y \end{array}\right\} \Rightarrow$ **10^a = ?**

A) $\dfrac{xy}{5}$ B) $\dfrac{3xy}{4}$ C) $\dfrac{xy}{2}$ D) $\dfrac{2xy}{9}$ E) $\dfrac{2xy}{25}$

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13. $\dfrac{1}{2^{1-a}-1} + \dfrac{1}{2^{a-1}-1} =$ **?**

A) 1 B) 2^a C) 2^{a-1} D) –1 E) $2^a - 1$

14. $3^{a-b} - 3^{b-a} = 4 \Rightarrow \dfrac{9^a - 9^b}{3^{a+b+1}} =$ **?**

A) –1 B) 0 C) $\dfrac{4}{3}$ D) $\dfrac{5}{8}$ E) 1

15. $\left.\begin{array}{l} 16^{x+4} = 81y^4 \\ 6^x = 12 \\ 3^{-x} = k \cdot y \end{array}\right\} \Rightarrow$ **k = ?**

A) $\dfrac{1}{3}$ B) $\dfrac{1}{4}$ C) $\dfrac{1}{9}$ D) $\dfrac{1}{16}$ E) $\dfrac{1}{64}$

16. $\left.\begin{array}{l} x = (2^3)^4 \\ y = (2)^{4^3} \\ z = (2)^{3^4} \end{array}\right\} \Rightarrow$ **? < ? < ?**

A) x = y = z B) x < y < z C) y < x < z D) z < x < y E) x < z < y

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1	2	3	4	5	6	7	8
D	E	B	E	E	B	D	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
A	B	A	E	D	C	E	B

1. $2^{3x+1} = m \Rightarrow 2^{6x-2} = ?$

A) $\frac{m}{4}$ B) $\frac{m}{16}$ C) $\frac{m^2}{4}$ D) $\frac{m^2}{16}$ E) $\frac{m}{32}$

2. $\dfrac{2^{11}+2^{12}+2^{13}+2^{14}}{2^{-9}+2^{-8}+2^{-7}+2^{-6}} = ?$

A) 2^{14} B) 2^{16} C) 2^{18} D) 2^{20} E) 2^{22}

3. $\dfrac{2^{m-n}}{4^{n-m}} = ?$

A) 2^{m-n} B) 4^{m-n} C) 8^{m-n} D) 4^{n-m} E) 8^{n-m}

4. $\dfrac{1}{2^{x-2}} \cdot \dfrac{2}{4^{1-x}} = ?$

A) 2^x B) 2^{x+1} C) 2^{x+2} D) 2^{x+3} E) 2^{x+4}

5. $3^{x-1} \cdot 15^{1-x} = 25^{x+2} \Rightarrow x = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

6. $\left.\begin{array}{l} a = 3^{3x-1} \\ b = 9^{x+1} \\ a^2 = b^2 \end{array}\right\} \Rightarrow x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

7. $(2^m - 4^m) \cdot (1 - 2^{2m})^{-1} \cdot (4^m + 2 \cdot 2^m + 1) = ?$

A) 2^m B) 4^m C) 8^m D) 4^{m+4} E) $2^m + 4^m$

8. $\left.\begin{array}{l} a^2 = 2^{3x+8} \\ 4a = 8^{x+1} \end{array}\right\} \Rightarrow x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $\dfrac{15^{1-2x}\cdot 9^{x}}{25^{2-x}}=\dfrac{3^{1-x}}{125} \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

10. $\sqrt{\dfrac{5}{4^{x-1}}+2^{4-2x}}=?$

A) 2^{-x} B) $3\cdot 2^{-x}$ C) $5\cdot 8^{-x}$ D) $6\cdot 2^{-x}$ E) 2^{-2x}

11. $2^{\frac{1}{16}}=x \Rightarrow \left(2^{\frac{1}{16}}+1\right)\cdot\left(2^{\frac{1}{8}}+1\right)\cdot\left(2^{\frac{1}{4}}+1\right)\cdot\left(2^{\frac{1}{2}}+1\right)=?$

A) $\dfrac{1}{x-4}$ B) $\dfrac{1}{x}$ C) $\dfrac{1}{x-2}$ D) $\dfrac{1}{x-1}$ E) $\dfrac{1}{x+1}$

12. $\left.\begin{array}{l}5^{x}=25\\ x^{y}=\dfrac{1}{4}\end{array}\right\} \Rightarrow x-y^{x-y}=?$

A) –14 B) –12 C) –8 D) –6 E) –4

13. $(0,5)^{-x}+\dfrac{3}{2^{1-x}}=20 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

14. $20^{x}=45$

$\Rightarrow 5^{x-1}\cdot 2^{2x+1}=?$

A) 12 B) 14 C) 16 D) 18 E) 20

15. $\dfrac{3^{x+1}+6}{9^{x}-4}=\dfrac{3}{7} \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

16. $2^{x+2}=12$

$15^{y+1}=(125)^{2}\cdot(64)^{x} \Rightarrow$ **y = ?**

A) 1 B) 3 C) 5 D) 6 E) 7

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1	2	3	4	5	6	7	8
D	D	C	B	B	C	E	B
9	10	11	12	13	14	15	16
A	D	D	A	C	D	B	C

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1. $2^x - 3 \cdot 2^x = A \cdot 3^{x-1}$,

$\left(\frac{2}{3}\right)^x = 4 \Rightarrow$ **A = ?**

A) –24 B) –20 C) –16 D) –12 E) –10

2. $\frac{2^a + 4^a + 8^a}{1 + 2^a + 4^a} = \frac{1}{4} \Rightarrow$ **a^2 = ?**

A) 1 B) 4 C) 9 D) 16 E) 25

3. $2^{1-x} = 3 \Rightarrow \frac{2 \cdot 3^{x+1}}{6^x} = ?$

A) 5 B) 6 C) 7 D) 8 E) 9

4. $\left.\begin{array}{l} 3^x = 25 \\ 3 = 5^y \end{array}\right\} \Rightarrow$ **3^{xy+x} = ?**

A) 125 B) 150 C) 175 D) 225 E) 250

5. $\frac{3^{x+2} - 2 \cdot 3^{x+1}}{3^x + 3^{x+1}} = \frac{x+2}{x-1} \Rightarrow$ **x = ?**

A) –11 B) –9 C) –7 D) –5 E) –3

6. $(0{,}005)^5 \cdot (0{,}04)^4 = A \cdot 10^x \Rightarrow$ **min(A) + x = ?**

A) –12 B) –10 C) –8 D) –6 E) –4

7. $\left.\begin{array}{l} 2^x = 18 \\ 4^y = 65 \\ 5^z = 120 \end{array}\right\} \Rightarrow$ **? > ? > ?**

A) x > y > z B) x > z > y C) y > x > z D) y > z > x E) z > y > x

8. $\left.\begin{array}{l} x^{y-1} = 5 \\ x^y - 12 = x \end{array}\right\} \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $x \in \mathbb{Z}$,

$\dfrac{2^{x+3}-2^{x+2}}{2^{x-3}-2^{x-4}} = x^y$, min(x) için (for) $\Rightarrow$ **x + y = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

10. $\left(\dfrac{0,0032}{0,0002}\right)^{a+2} = \dfrac{1}{256} \Rightarrow$ **a = ?**

A) –5 B) –4 C) –3 D) –2 E) –1

11. $\left.\begin{array}{l} 2^x = a \\ 3^x = b \end{array}\right\} \Rightarrow$ **108^x = ?**

A) ab^2 B) ab^3 C) a^2b D) a^2b^2 E) a^2b^3

12. $5^6 \cdot (250)^5 \cdot 625^8 = a \cdot 5^b \Rightarrow$ **min(a) için (for), a + b = ?**

A) 72 B) 75 C) 84 D) 85 E) 96

13. $(-24)^3 \cdot (-16^5) \cdot (-64)^8 = a \cdot 2^b$, min(a) için (for),

$\Rightarrow$ **b – a = ?**

A) 20 B) 30 C) 40 D) 50 E) 60

14. $\left(\dfrac{5}{3}\right)^{a-b} \cdot \left(\dfrac{3}{5}\right)^{-a} = \dfrac{81}{625} \Rightarrow$ **2a – b = ?**

A) –5 B) –4 C) –3 D) –2 E) –1

15. $\left.\begin{array}{l} 3^x \cdot 4^y = 72 \\ 4^x \cdot 3^y = 24 \end{array}\right\} \Rightarrow$ **x + y = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

16. $\left.\begin{array}{l} a^{a+b} = b^9 \\ b^{a+b} = b^3a^{12} \end{array}\right\} \Rightarrow$ **a + b = ?**

A) 6 B) 8 C) 10 D) 12 E) 14

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1	2	3	4	5	6	7	8
A	B	E	D	A	B	A	C
9	10	11	12	13	14	15	16
D	B	E	D	D	B	C	D

1. $2^x + 2^{-x} = 3 \Rightarrow$ **$4^x + 4^{-x} = ?$**

A) 4 B) 5 C) 6 D) 7 E) 8

2. $x, y, z, \in R$,

$2^{2x-4} = 7^{y+1} = 3^{2z-2}$

$\Rightarrow$ **$x + y + z = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $\left.\begin{array}{l} 2^x = 5 \\ 2^y = 15 \end{array}\right\} \Rightarrow$ **$2^{2x-y} = ?$**

A) $\frac{2}{5}$ B) $\frac{3}{5}$ C) $\frac{4}{5}$ D) $\frac{5}{2}$ E) $\frac{5}{3}$

4. $\left.\begin{array}{l} 2^a = 9 \\ 27^b = 8 \end{array}\right\} \Rightarrow$ **$a \cdot b = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

5. $\left.\begin{array}{l} 3^x = 2 \\ 81^{x-1} = y^4 \end{array}\right\} \Rightarrow$ **$y = ?$**

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) $\frac{3}{2}$ D) $\frac{4}{3}$ E) $\frac{3}{4}$

6. $\frac{7^{2x} - 1}{7^{x+1} + 7} = \frac{48}{7} \Rightarrow$ **$x = ?$**

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

7. $\frac{3^x + 1}{3^{x+y} + 3^x + 3^y + 1} = \frac{1}{244} \Rightarrow$ **$y = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

8. $\frac{1}{3^{a-2}} + \frac{1}{3^{a-1}} = 4 \Rightarrow$ **$a = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $\dfrac{3^a+9^a+15^a}{1+3^a+5^a}=81 \Rightarrow$ **a = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

10. $2^{x-1}=3,\ 4^{3y+1}=12 \Rightarrow \dfrac{\mathbf{x-1}}{\mathbf{y}}=$ **?**

A) 3 B) 4 C) 5 D) 6 E) 7

11. $\left.\begin{array}{l}5^{2x-y}=125\\2^{3x+y}=128\end{array}\right\} \Rightarrow$ **x + y = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

12. $\left.\begin{array}{l}3^x=4\\9^y=2\end{array}\right\} \Rightarrow \dfrac{\mathbf{x+y}}{\mathbf{x-y}}=$ **?**

A) $\frac{2}{5}$ B) $\frac{3}{5}$ C) $\frac{4}{5}$ D) $\frac{5}{3}$ E) $\frac{5}{2}$

13. $x^a=5\cdot x^2$,
$25\cdot5^a=(x)^{b^2} \Rightarrow$ **a^2-b^2 = ?**

A) 4 B) 6 C) 8 D) 10 E) 12

14. $\left.\begin{array}{l}\dfrac{a}{3}=b\\a^{a+5}=b^{6b+10}\end{array}\right\} \Rightarrow$ **2a − b = ?**

A) 12 B) 13 C) 15 D) 16 E) 18

15. $\left.\begin{array}{l}2^{x+y}=0,125\\(0,125)^{x-y}=2\end{array}\right\} \Rightarrow$ **x^2-y^2 = ?**

A) 2 B) 4 C) 6 D) 8 E) 10

16. $\left.\begin{array}{l}x=2+2^{a-1}\\y=2-2^{a+1}\end{array}\right\} \Rightarrow$ **y = ?**

A) 10 − 4x B) 10 − 2x C) 10 − x D) 2x − 10 E) 4x − 10

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1	2	3	4	5	6	7	8
D	B	E	B	B	D	E	A
9	10	11	12	13	14	15	16
C	D	B	D	A	C	A	A

1. $5^x = y \Rightarrow y^3 \cdot 5^{2-3x} = ?$

A) 5 B) 10 C) 15 D) 25 E) 50

2. $\left.\begin{array}{l} 2^{2x} = 49 \\ 2^y = 7 \end{array}\right\} \Rightarrow \dfrac{x+2y}{3y-x} = ?$

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

3. $\left.\begin{array}{l} 3^a \cdot 4^b = 12 \\ 4^a \cdot 3^b = 144 \end{array}\right\} \Rightarrow a+b = ?$

A) 1 B) 3 C) 5 D) 7 E) 11

4. $\left.\begin{array}{l} m = 2^x \\ n = 5^{2x+1} \end{array}\right\} \Rightarrow (0{,}08)^x = ?$

A) $\frac{m}{n}$ B) $\frac{5m}{n}$ C) $\frac{5n}{m}$ D) 5m E) 5n

5. $\left.\begin{array}{l} 2^x = m \\ 3^x = n \end{array}\right\} \Rightarrow 192^x = ?$

A) m^6n B) m^5n^2 C) m^4n^3 D) m^3n^4 E) m^2n^5

6. $\dfrac{12^n + 12^n + 12^n}{6^n + 6^n + 6^n + 6^n + 6^n + 6^n} = 64 \Rightarrow n = ?$

A) 1 B) 3 C) 5 D) 7 E) 9

7. $x, y, z \in R$,

$5^{x+2} = 7^{2y-6} = 3^{z-2} \Rightarrow x+y+z = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $\left.\begin{array}{l} x = 2^{m-1} \\ 4x = 16^{\frac{m}{2}-2} \end{array}\right\} \Rightarrow m = ?$

A) 9 B) 8 C) 6 D) 4 E) 2

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9. $\dfrac{8 \cdot 4^{x-1}}{2^{3x+2}} = 16 \Rightarrow$ **x = ?**

A) –7 B) –5 C) –3 D) 1 E) 3

10. $\dfrac{2^x + 2^x + 2^x + 2^x}{(0,4)^x + (0,4)^x} = 50 \Rightarrow$ **x = ?**

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

11. $\left.\begin{array}{l} A = 3^x + 3^{-x} \\ B = 9^x + 9^{-x} \end{array}\right\} \Rightarrow$ **B = ?**

A) $A^2 - 1$ B) $A^2 - 2$ C) $A^2 - 3$ D) $A^2 - 4$ E) $A^2 - 6$

12. $(x-3)^{x^2-9} = 1, \quad x \in Z \Rightarrow \sum x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

13. $\left.\begin{array}{l} 4^{x-1} = 2^{-x+4} \\ 9^{x-2y} = 27^{\frac{x}{2}+y} \end{array}\right\} \Rightarrow$ **y = ?**

A) $-\frac{1}{7}$ B) $-\frac{1}{3}$ C) $\frac{1}{3}$ D) $\frac{1}{7}$ E) $\frac{1}{14}$

14. $-2^{-6} : \left(-\frac{1}{2}\right)^{-3} = ?$

A) 2^{-7} B) 2^{-8} C) 2^{-9} D) 2^{-10} E) 2^{-11}

15. $\dfrac{32^{-1} \cdot 128^{10} \cdot 3}{96 \cdot 64^{10}} = ?$

A) –2 B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) 1 E) 2

16. $x, n \in N^+$,

$25^{12} \cdot 4^{11} = x \cdot 10^n \Rightarrow$ **n + x = ?**

A) 41 B) 43 C) 45 D) 47 E) 49

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1	2	3	4	5	6	7	8
D	C	B	B	A	D	C	A
9	10	11	12	13	14	15	16
B	C	B	A	D	C	D	D

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1. $3^a = k \Rightarrow \dfrac{81^{a+1}}{27} = ?$

A) $\dfrac{k^2}{3}$ B) $\dfrac{k^3}{3}$ C) $3k^3$ D) $4k^3$ E) $3k^4$

2. $2^{x-2} = 3 \Rightarrow 4^{x+1} = ?$

A) 144 B) 180 C) 240 D) 480 E) 576

3. $5^{2x+1} = 80 \Rightarrow 25^{x-1} = ?$

A) $\dfrac{4}{25}$ B) $\dfrac{16}{25}$ C) $\dfrac{25}{16}$ D) $\dfrac{25}{4}$ E) 25

4. $\dfrac{3^{x-2}+3^{x+1}}{2\cdot 3^{x+1}-3^x} = ?$

A) $-\dfrac{28}{45}$ B) $-\dfrac{26}{3}$ C) $-\dfrac{17}{3}$ D) $\dfrac{17}{3}$ E) $\dfrac{28}{45}$

5. $5^x = 81,\ 5^y = 3 \Rightarrow \dfrac{3x-y}{2x-3y} = ?$

A) $\dfrac{7}{3}$ B) $\dfrac{8}{5}$ C) $\dfrac{11}{5}$ D) $\dfrac{13}{3}$ E) $\dfrac{12}{5}$

6. $81^x = 8,\ 32^y = 9 \Rightarrow y = ?$

A) $\dfrac{1}{10x}$ B) $\dfrac{3}{10x}$ C) $\dfrac{7}{10x}$ D) $\dfrac{x}{10}$ E) $\dfrac{3x}{10}$

7. $x \in Z$,

$\left(\dfrac{2}{3}\right)^{3x-5} < \left(\dfrac{2}{3}\right)^{2x-17} \Rightarrow \min(x) = ?$

A) –11 B) –12 C) –13 D) –14 E) –15

8. $(x+3)^{x^2-4} = 1$,

$ÇK(SS) = \{x_1, x_2, x_3\} \Rightarrow \sum x = ?$

A) –4 B) –2 C) 0 D) 2 E) 4

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9. $a = -3$ ve $b = -\frac{1}{2} \Rightarrow b^a + a^{-(b)^{-1}} = ?$

A) $-\frac{1}{3}$ B) $-\frac{1}{2}$ C) -1 D) 1 E) $\frac{1}{2}$

10. $3^x = 2 \Rightarrow 27^x + 9^{x+1} = ?$

A) 36 B) 42 C) 44 D) 46 E) 52

11. $\frac{4 \cdot 3^x - 2 \cdot 3^{x-2}}{3^x - 3^{x-1}} = ?$

A) $\frac{17}{2}$ B) $\frac{19}{2}$ C) $\frac{23}{2}$ D) $\frac{17}{3}$ E) $\frac{19}{3}$

12. $9^{x+2} = 27^{x-1} \Rightarrow 5^{x-5} = ?$

A) $\frac{1}{25}$ B) $\frac{1}{5}$ C) 5 D) 25 E) 125

13. $(0,6)^{2x-8} = \left(\frac{5}{3}\right)^{3x-2} \Rightarrow 2^{-x+1} + 3^x = ?$

A) $\frac{17}{2}$ B) $\frac{19}{2}$ C) $\frac{21}{2}$ D) $\frac{23}{2}$ E) $\frac{25}{2}$

14. $\left.\begin{matrix} 2^x = 18 \\ 3^y = 49 \\ 5^z = 81 \end{matrix}\right\} \Rightarrow ? < ? < ?$

A) $x < y < z$ B) $y < z < x$ C) $z < y < x$ D) $x < z < y$ E) $z < x < y$

15. $\left.\begin{matrix} 2^x \cdot 3^y = 54 \\ 3^x \cdot 2^y = 4 \end{matrix}\right\} \Rightarrow x + y = ?$

A) 1 B) 2 C) 3 D) 4 E) 6

16. $(4^{0,72} : 2) = ?$

A) $2^{1,44}$ B) $2^{0,72}$ C) $2^{0,44}$ D) $2^{0,22}$ E) $2^{0,11}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	E	B	E	C	B	A	A
9	10	11	12	13	14	15	16
D	C	D	D	B	C	C	C

1. $5^{a-2} = 3^{2b+1} = 2^{4c-1} \Rightarrow$ **a – 3b + 2c = ?**

A) $\frac{5}{6}$ B) $\frac{1}{6}$ C) $\frac{1}{2}$ D) 2 E) 4

2. $\dfrac{7{,}2 \cdot 10^3 \cdot 0{,}3 \cdot 10^{-2}}{8 \cdot 10^{-3}} = A \cdot 10^n \Rightarrow$ **A + n = ?**

A) 23 B) 25 C) 27 D) 29 E) 32

3. $\dfrac{3^x \cdot 4^x}{3^{x-2} \cdot 2^{2x-1}} = ?$

A) 18 B) 14 C) 10 D) 6 E) 4

4. $5^{x+1} = 3 \Rightarrow$ $5^{2x+3} = ?$

A) 27 B) 36 C) 40 D) 45 E) 54

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5. $x^m = y^{m+1} \Rightarrow \left(\dfrac{x}{y}\right)^{2m+1} = ?$

A) y^2 B) $\frac{x^2}{y}$ C) $\frac{y^2}{x}$ D) $x \cdot y$ E) $\frac{12}{5}$

6. $\dfrac{5^x + 10^x + 25^x}{5^x + 2^x + 1} = 125 \Rightarrow$ $2^{x+1} = ?$

A) $\frac{1}{2}$ B) 2 C) 4 D) 8 E) 16

7. $75^{12} = 9^x \cdot 25^{12} \Rightarrow$ $2^x \cdot 7^{x-6} = ?$

A) 16 B) 32 C) 64 D) 128 E) 256

8. $\dfrac{0{,}003 \cdot 10^{27} + 0{,}5 \cdot 10^{25}}{0{,}02 \cdot 10^{26}} = ?$

A) 2 B) 4 C) 6 D) 8 E) 10

9. $\left.\begin{array}{l}2^x = 3\\ 3^y = 25\\ 5^z = 32\end{array}\right\} \Rightarrow$ **$x \cdot y \cdot z = ?$**

A) 4 B) 9 C) 10 D) 28 E) 36

10. $\dfrac{3^{x-1}}{5^{3-x}+1} + \dfrac{3^{x-1}}{5^{x-3}+1} = 27 \Rightarrow$ **$x = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

11. $\left.\begin{array}{l}a \cdot b = a^b\\ \dfrac{a^2}{b} = a^{3b}\end{array}\right\} \Rightarrow$ **$b = ?$**

A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{4}$ D) $\frac{4}{3}$ E) $\frac{3}{2}$

12. $\left.\begin{array}{l}x = 3^{54}\\ y = 5^{36}\\ z = 2^{72}\end{array}\right\} \Rightarrow$ **$? < ? < ?$**

A) $y < x < z$ B) $y < z < x$ C) $x < y < z$ D) $z < y < x$ E) $z < x < y$

13. $\mathbf{5^{x+1} + 5^x = 48}$

$25^x = 32^y \Rightarrow$ **$y = ?$**

A) $\frac{5}{6}$ B) $\frac{6}{5}$ C) $\frac{8}{5}$ D) $\frac{5}{8}$ E) $\frac{3}{5}$

14. $2^{1-2x} = \dfrac{2}{9} \Rightarrow$ $\mathbf{\dfrac{4 \cdot 3^{x+2}}{6^{x+1}} = ?}$

A) -1 B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) 1 E) 2

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15. $\dfrac{2^x + 2^{-x}}{1 + 4^x} = 64 \Rightarrow$ $\mathbf{3^{x+4} = ?}$

A) $\frac{1}{9}$ B) $\frac{1}{3}$ C) 3 D) 9 E) 27

16. $\left.\begin{array}{l}2^{x+y} - 3^{y+2} = -11\\ 3^{y+1} - 2^x = 1\end{array}\right\} \Rightarrow$ **$x + y = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	D	A	D	D	E	C	B
9	10	11	12	13	14	15	16
C	D	C	D	B	E	A	D

1. $8^x + 8^x + 8^x + 8^x = 8^y \cdot 8^y \cdot 8^y \Rightarrow \dfrac{x}{9y-2} = ?$

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 3

2. $(0,\overline{3})^{x+1} = m \Rightarrow 9^{x+2} = ?$

A) $\frac{1}{m^2}$ B) $\frac{3}{m^2}$ C) $\frac{9}{m^2}$ D) $\frac{27}{m^2}$ E) $\frac{81}{m^2}$

3. $7^{x-9} = 14^{x-10} \Rightarrow 4^{x-11} = ?$

A) $\frac{7}{2}$ B) $\frac{7}{4}$ C) $\frac{7}{8}$ D) $\frac{49}{2}$ E) $\frac{49}{4}$

4. $\left(\underbrace{8^9 + 8^9 + 8^9 + \ldots + 8^9}_{32 \text{ tane / } 32 \text{ times}}\right) : 4^4 \cdot 4^4 \cdot 4^4 \cdot 4^4 = ?$

A) 1 B) 2 C) 4 D) 8 E) 16

5. $\left.\begin{array}{l} 5^x = 27 \\ 81 = 25^y \end{array}\right\} \Rightarrow \dfrac{3x+y}{x-2y} = ?$

A) −13 B) −12 C) −11 D) −9 E) −7

6. $(2x-9)^{2012} = (x-3)^{2012} \Rightarrow \sum x = ?$

A) 4 B) 5 C) 6 D) 8 E) 10

7. $(x+2)^{x^2-x-6} = 1 \Rightarrow \sum x = ?$

A) −2 B) −1 C) 0 D) 1 E) 2

8. $3^{1-x} - \dfrac{5}{3^{x-1}} = -108 \Rightarrow x = ?$

A) −2 B) −1 C) 2 D) 4 E) 6

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9. $\dfrac{2^{x+1}+5\cdot 2^{x-1}+3\cdot 2^{x-2}}{2^{x+2}+\dfrac{1}{5}\cdot 2^{x}}=?$

A) $\frac{2}{5}$ B) $\frac{4}{5}$ C) $\frac{5}{2}$ D) $\frac{5}{4}$ E) $\frac{1}{5}$

10. $\dfrac{5^x}{3}+5^{x+1}-5^x\cdot 2=\dfrac{250}{3} \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

11. $x^x=2^{24},\ y^y=3^{18} \Rightarrow \dfrac{2y+3x}{y-x}=?$

A) 17 B) 23 C) 32 D) 36 E) 42

12. $\left[\dfrac{x^{a-b}}{x^{-b}}\right]^b : \left[\dfrac{x^{b-a}}{x^{-a}}\right]^a=?$

A) x^a B) x^b C) 1 D) x E) $\frac{1}{x}$

13. A, n ∈ N,

$(32)^6\cdot(125)^9=A\cdot 10^n \Rightarrow$ **min(A + n) = ?**

A) 32 B) 35 C) 38 D) 40 E) 45

14. $a=1+x^{-1},\ b=1-x^{-2} \Rightarrow \left(\dfrac{a}{b}\right)^{-1}=?$

A) $\frac{x}{x-1}$ B) $\frac{x}{x+1}$ C) $\frac{x-1}{x}$ D) $\frac{x+1}{x}$ E) $\frac{1}{x^2}$

15. $9^{x+\frac{1}{2}}=48 \Rightarrow 27^{x-\frac{2}{3}}=?$

A) $\frac{64}{9}$ B) $\frac{32}{3}$ C) $\frac{27}{2}$ D) $\frac{81}{4}$ E) $\frac{81}{2}$

16. $2^x=3 \Rightarrow 6^{\frac{1}{x+1}}=?$

A) 3 B) 2 C) $\frac{1}{2}$ D) $\frac{1}{3}$ E) $\frac{1}{6}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	C	E	A	C	E	B	A
9	10	11	12	13	14	15	16
D	B	E	C	B	C	A	B

1. $\dfrac{1+2^{x-y}}{1+2^{y-x}} = 4 \Rightarrow$ **x − y = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

2. $\left.\begin{aligned} a^2 &= 2^{6x+4} \\ \frac{a}{4} &= 16^{x-2} \end{aligned}\right\} \Rightarrow$ **x = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

3. $\left.\begin{aligned} x^{y+2} &= a^3 \\ x^{2-2y} &= b^3 \end{aligned}\right\} \Rightarrow$ **x^y = ?**

A) $\frac{b}{a}$ B) $\frac{a}{b}$ C) $\frac{b^2}{a}$ D) $\frac{a^2}{b}$ E) $\frac{a}{b^2}$

4. $\left.\begin{aligned} 3^{a+b} &= 2 \\ 2^{a+b} &= 5 \end{aligned}\right\} \Rightarrow$ **36^{a+b} = ?**

A) 10 B) 40 C) 50 D) 80 E) 100

5. $4 \cdot 3^{x+2} + 18 \cdot 2^{x+1} = a^2$ ve (and),

$2^x + 3^x = a \Rightarrow$ **a = ?**

A) 6 B) 12 C) 18 D) 24 E) 36

6. $\left.\begin{aligned} 3^a &= 15^{a-1} \\ 6^a &= 10^{a+1} \end{aligned}\right\} \Rightarrow$ **3^a = ?**

A) 115 B) 120 C) 135 D) 150 E) 180

7. $\left.\begin{aligned} 3^x &= 15 \\ 5^y &= 45 \end{aligned}\right\} \Rightarrow$ **y = ?**

A) $\frac{x-1}{x+1}$ B) $\frac{x+1}{x-1}$ C) $\frac{x}{x-1}$ D) $\frac{x}{x+1}$ E) $\frac{x+1}{x}$

8. $\left.\begin{aligned} x &= 3^n - 1 \\ y &= 3^{-n} + 1 \end{aligned}\right\} \Rightarrow$ **x = ?**

A) $\frac{2-y}{y-1}$ B) $\frac{1-y}{y-2}$ C) $\frac{y+1}{y-1}$ D) $\frac{y+1}{y-2}$ E) $\frac{y-2}{y+1}$

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9. $\left.\begin{array}{l}\frac{a}{b}=2\\ \left(\frac{b}{a}\right)^{\frac{1}{x}}=64\end{array}\right\} \Rightarrow \mathbf{3^{6x}=?}$

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) $\frac{2}{3}$ D) $\frac{3}{2}$ E) $\frac{4}{3}$

10. $\left.\begin{array}{l}4^x=27\\ 3^y=512\end{array}\right\} \Rightarrow \mathbf{x \cdot y=?}$

A) $\frac{15}{2}$ B) $\frac{17}{2}$ C) $\frac{23}{2}$ D) $\frac{25}{2}$ E) $\frac{27}{2}$

11. $\left.\begin{array}{l}6^{n+1}=a\\ 6^{2-n}=b\end{array}\right\} \Rightarrow \mathbf{\frac{a \cdot b}{12}=?}$

A) 12 B) 14 C) 16 D) 18 E) 20

12. $3^{x+1}=2^{x+1} \Rightarrow \mathbf{4^x+\frac{1}{4}=?}$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 1 E) 2

13. $2^{x+1}=6^{x+1} \Rightarrow \mathbf{9^{x+2}=?}$

A) 6 B) 9 C) 12 D) 18 E) 27

14. $a, b \in N^+$,

$a^b=81$,

$b^a=64$

$\Rightarrow \mathbf{2a+3b=?}$

A) 18 B) 24 C) 28 D) 32 E) 36

15. $2^{\frac{3}{2}} \cdot 3^{\frac{1}{2}} \cdot 6^{\frac{3}{2}}=a^b \cdot b^a \Rightarrow \mathbf{a+b=?}$

A) 3 B) 5 C) 7 D) 9 E) 10

16. $\left.\begin{array}{l}x^{m+n}=54\\ x^{m-n}=6\end{array}\right\} \Rightarrow \mathbf{\frac{x^m+x^n}{x^m-x^n}=?}$

A) $\frac{2}{5}$ B) $\frac{3}{5}$ C) $\frac{5}{7}$ D) $\frac{5}{8}$ E) $\frac{7}{5}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	D	B	E	E	D	B	A
9	10	11	12	13	14	15	16
A	E	D	C	B	A	B	E

1. $2^{3x-4} = 32 \Rightarrow x^2 = ?$

A) 1 B) 2 C) 4 D) 9 E) 16

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

2. $\dfrac{2^4+2^7+2^{10}}{2^{-4}+2^{-7}+2^{-10}} = ?$

A) 2^9 B) 2^{12} C) 2^{14} D) 2^{18} E) 2^{20}

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

3. $a, b \in Z$,

$\dfrac{5^{a-b}}{27^{a+b}} = 135 \Rightarrow a^2 - b^2 = ?$

A) –3 B) –1 C) 0 D) 1 E) 3

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

4. $\left(\dfrac{1}{27}\right)^{2-x} = 9^{x-1} \Rightarrow x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

5. $4^{2-\frac{x}{2}} \le 1 \le 3^{6-x}$

$x \in Z \Rightarrow \sum x = ?$

A) 5 B) 10 C) 15 D) 20 E) 25

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2017]

6. $0 < x,\ 5^x = a \Rightarrow \dfrac{25^{x+1} - 25}{5^{x+1} - 5} = ?$

A) 3(a + 1) B) 5(a + 1) C) 3(a – 1) D) –5(a + 1) E) 5(a – 1)

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2017]

7. $2^a = 5 \Rightarrow \dfrac{12^{a+2}}{6^{a+1}} = ?$

A) 20 B) 48 C) 60 D) 84 E) 120

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

8. $x \in Z$,

$\left(\dfrac{1}{27}\right)^{3x} > (81)^{11} \Rightarrow \max(x) = ?$

A) –6 B) –2 C) –5 D) 4 E) 5

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $\dfrac{4^{-2}-9^{-2}}{(6^{-2})^{2}}=?$

A) 24 B) 36 C) 54 D) 65 E) 70

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

10. $625^{-3x}=\left(\frac{1}{5}\right)^{4x-8} \Rightarrow 81^{x}=?$

A) 1 B) $\frac{1}{81}$ C) 3 D) 9 E) 27

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS-2017]

11. $5^{x}=3^{y} \Rightarrow 3^{\frac{3y}{x}}+5^{\frac{2x}{y}}=?$

A) 8 B) 14 C) 28 D) 134 E) 152

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

12. $\dfrac{2^{4}+2^{5}+2^{6}}{2^{2}+2^{3}+2^{4}}=?$

A) 2 B) 4 C) 8 D) 16 E) 32

[BALIKESİR ÜNİVERSİTESİ – YÖS 2017]

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13. $(-2a)^{5}\cdot(-a^{2})\cdot(-a^{2})^{-3}=?$

A) $-2a^{5}$ B) $-2^{5}\cdot a^{5}$ C) $-2a^{-5}$ D) $2^{5}\cdot a^{5}$ E) $-2^{5}\cdot a$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

14. $3^{m}=5^{n} \Rightarrow 27^{\frac{m}{n}}=?$

A) 5 B) 9 C) $\frac{25}{9}$ D) 25 E) 125

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

15. $\dfrac{9^{3n+1}+27^{2n}}{3^{6n-1}}+\dfrac{4^{3n}-8^{2n-1}}{2^{6n-5}}=?$

A) 18 B) 30 C) 36 D) 43 E) 58

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

16. $\left.\begin{array}{l}3^{2x}=25\\5^{y}=27\end{array}\right\} \Rightarrow x\cdot y=?$

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) 3

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2015]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	C	D	D	C	B	E	C
9	10	11	12	13	14	15	16
D	B	D	B	E	E	E	E

BÖLÜM CHAPTER 4

TARİHSEL NOT / HISTORICAL NOTE

Leonhard Euler [1707 – 1783]

Leonhard Euler, matematik, fizik, analitik geometri, trigonometri ve sayı teorisi konusunda katkılarda bulunan bir İsveç matematikçisidir.

Leonhard Euler was a Swiss mathematician who made enormous contibutions to a wide range of mathematics and physics including analytic geometry, trigonometry, geometry, calculus and number theory.

KÖKLÜ SAYILAR
RADICALS

Bu bölüm 128 alıştırma sorusu, 272 test sorusu, 16 YÖS sorusu içermektedir.

This chapter includes 128 exercise questions, 272 test questions, and 16 YÖS questions,.

BÖLÜM / CHAPTER 4

KÖKLÜ SAYILAR / RADICALS

- Köklü Sayılar / Radicals .... 175 - 228

KÖKLÜ SAYILAR
RADICALS

1. $\sqrt{4}-\sqrt{9}+\sqrt{16}=?$

Yanıt / The Answer is 3

2. $\sqrt{36}+\sqrt{25}-\sqrt{64}=?$

Yanıt / The Answer is 3

3. $\sqrt{49}-\sqrt{81}+\sqrt{144}=?$

Yanıt / The Answer is 10

4. $\sqrt{49}-\sqrt{81}+\sqrt{16}=?$

Yanıt / The Answer is 2

5. $\sqrt{1}+\sqrt{100}-\sqrt{121}=?$

Yanıt / The Answer is 0

6. $\sqrt{196}+\sqrt{225}-\sqrt{169}=?$

Yanıt / The Answer is 16

7. $\sqrt{25}\cdot\sqrt{121}-\sqrt{4}\cdot\sqrt{81}=?$

Yanıt / The Answer is 37

8. $\sqrt{256}:\sqrt{64}+\sqrt{169}\cdot\sqrt{9}=?$

Yanıt / The Answer is 41

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9. $\sqrt{35+14}+\sqrt{79+2}-\sqrt{154-10}=?$

Yanıt / The Answer is 4

10. $\sqrt{80-16}-\sqrt{98+2}+\sqrt{113+8}=?$

Yanıt / The Answer is 9

11. $\sqrt{4\cdot3-5\cdot2+71\cdot2}=?$

Yanıt / The Answer is 12

12. $\sqrt[3]{64}+\sqrt[3]{27}=?$

Yanıt / The Answer is 7

13. $\sqrt{\sqrt{16}}+\sqrt{\sqrt{81}}=?$

Yanıt / The Answer is 5

14. $\sqrt{7+\sqrt{2+\sqrt{1+\sqrt{9}}}}=?$

Yanıt / The Answer is 3

15. $\sqrt{\sqrt{625}}-\sqrt[3]{8}=?$

Yanıt / The Answer is 3

16. $\sqrt{21+\sqrt{13+\sqrt{7+\sqrt{4}}}}=?$

Yanıt / The Answer is 5

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17. $\sqrt{87-\sqrt{31+\sqrt{28-\sqrt{9}}}} = ?$

Yanıt / The Answer is 9

18. $\sqrt{13+\sqrt{152-\sqrt{57+\sqrt{49}}}} = ?$

Yanıt / The Answer is 5

19. $\sqrt{\frac{25}{4}}+\sqrt{\frac{16}{9}}+\sqrt{\frac{25}{36}} = ?$

Yanıt / The Answer is $\frac{14}{3}$

20. $\sqrt{\frac{1}{4}}+\sqrt{\frac{25}{144}}-\sqrt{\frac{4}{9}} = ?$

Yanıt / The Answer is $\frac{1}{4}$

21. $\sqrt[3]{\frac{8}{27}}-\sqrt[3]{\frac{64}{125}}+\sqrt{\frac{169}{225}} = ?$

Yanıt / The Answer is $\frac{11}{15}$

22. $\sqrt[4]{77+\sqrt[3]{70-\sqrt{36}}} = ?$

Yanıt / The Answer is 3

23. $x \in \mathbb{N},\ A \in \mathbb{R}$

$A = \sqrt{8-2x} \Rightarrow \sum x = ?$

Yanıt / The Answer is 10

24. $x \in \mathbb{Z},\ A \in \mathbb{R}$

$A = \sqrt[4]{x-3}-\sqrt{15-3x} \Rightarrow \sum x = ?$

Yanıt / The Answer is 12

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25. $x \in Z,\ A \in R$

$A = \sqrt[6]{x} + \sqrt[4]{x-3} + \sqrt{8-x} \Rightarrow \sum x = ?$

Yanıt / The Answer is 33

26. $x \in Z,\ A \in R$

$A = \sqrt{18-2x} + \sqrt{3x+6} \Rightarrow \sum x = ?$

Yanıt / The Answer is 42

27. $x \in Z,\ A \in R$

$A = \sqrt{4x+1} + \sqrt[4]{12-2x} \Rightarrow \sum x = ?$

Yanıt / The Answer is 21

28. $x \in Z,\ A \in R$

$A = \dfrac{\sqrt{x-3} + \sqrt{6-2x} - 4x^2}{x} \Rightarrow A = ?$

Yanıt / The Answer is –12

29. $x \in Z,\ A \in R$

$A = \dfrac{4x^2 + 3 + \sqrt{2x-3} + \sqrt[4]{3-2x}}{2x} \Rightarrow A = ?$

Yanıt / The Answer is 4

30. $\sqrt{\dfrac{1}{16} + \dfrac{1}{9}} = ?$

Yanıt / The Answer is $\dfrac{5}{12}$

31. $\sqrt{\dfrac{1}{16} - \dfrac{1}{25}} = ?$

Yanıt / The Answer is $\dfrac{3}{20}$

32. $\sqrt{3 - \dfrac{2}{9}} + \sqrt{4 - \dfrac{19}{25}} = ?$

Yanıt / The Answer is $\dfrac{52}{15}$

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33. $\sqrt{1+\frac{11}{25}}-\sqrt{3+\frac{1}{16}}=?$

Yanıt / The Answer is $-\frac{11}{20}$

34. $\sqrt{2-\frac{23}{36}}+\sqrt{2-\frac{2}{9}}=?$

Yanıt / The Answer is $\frac{5}{2}$

35. $\sqrt{0,16}-\sqrt{0,01}+\sqrt{0,36}=?$

Yanıt / The Answer is 0,9

36. $\sqrt{1,21}+\sqrt{0,64}-\sqrt{1,44}=?$

Yanıt / The Answer is 0,7

37. $\sqrt{0,81}+\sqrt{1,69}-\sqrt{0,49}=?$

Yanıt / The Answer is 1,5

38. $\sqrt{1,69}-\sqrt{6,25}+\sqrt{0,04}=?$

Yanıt / The Answer is –1

39. $\dfrac{\sqrt{0,09}+\sqrt{0,16}}{\sqrt{0,04}-\sqrt{0,01}}=?$

Yanıt / The Answer is 7

40. $\dfrac{\sqrt{1,44}+\sqrt{1,69}}{\sqrt{0,49}-\sqrt{0,04}}=?$

Yanıt / The Answer is 5

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41. $\sqrt{1-0,64}+\sqrt{2-0,79}=?$

Yanıt / The Answer is 1,7

42. $\sqrt{1,33+0,36}-\sqrt{1,33-0,52}=?$

Yanıt / The Answer is 0,4

43. $\frac{\sqrt{0,04}}{\sqrt{0,25}}-\frac{\sqrt{0,1}}{\sqrt{0,9}}=?$

Yanıt / The Answer is $\frac{1}{15}$

44. $\frac{\sqrt{0,09}+\sqrt{2,25}}{\sqrt{0,36}-\sqrt{0,01}}=?$

Yanıt / The Answer is 3,6

45. $\frac{\sqrt{0,9}+\sqrt{1,6}-\sqrt{2,5}}{\sqrt{10}}=?$

Yanıt / The Answer is $\frac{1}{5}$

46. $2\sqrt{3}-4\sqrt{3}+5\sqrt{3}=?$

Yanıt / The Answer is $3\sqrt{3}$

47. $7\sqrt{2}+3\sqrt{2}-4\sqrt{2}=?$

Yanıt / The Answer is $6\sqrt{2}$

48. $7\sqrt{5}+13\sqrt{5}-4\sqrt{5}=?$

Yanıt / The Answer is $16\sqrt{5}$

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49. $\sqrt{50}+\sqrt{72}-\sqrt{18}=?$

Yanıt / The Answer is $8\sqrt{2}$

50. $\sqrt{8}+\sqrt{98}-\sqrt{32}=?$

Yanıt / The Answer is $5\sqrt{2}$

51. $\sqrt{12}+\sqrt{75}-\sqrt{108}=?$

Yanıt / The Answer is $\sqrt{3}$

52. $\sqrt{180}-\sqrt{125}+\sqrt{80}=?$

Yanıt / The Answer is $5\sqrt{5}$

53. $\sqrt{3}\cdot\sqrt{12}+\sqrt{2}\cdot\sqrt{8}=?$

Yanıt / The Answer is 10

54. $\dfrac{\sqrt{5}+\sqrt{125}-\sqrt{245}}{\sqrt{3}-\sqrt{48}+\sqrt{108}}=?$

Yanıt / The Answer is $\dfrac{-\sqrt{15}}{9}$

55. $\dfrac{\sqrt{32}-3\sqrt{12}+\sqrt{8}}{\sqrt{27}-\sqrt{18}}=?$

Yanıt / The Answer is -2

56. $\dfrac{\sqrt{12}-\sqrt{15}}{2-\sqrt{5}}=?$

Yanıt / The Answer is $\sqrt{3}$

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57. $\dfrac{\sqrt{48}\cdot\sqrt{2}}{\sqrt{6}} = ?$

Yanıt / The Answer is 4

58. $\dfrac{\sqrt{42}\cdot\sqrt{14}}{\sqrt{3}} = ?$

Yanıt / The Answer is 14

59. $\dfrac{\sqrt{12}\cdot\sqrt{36}\cdot\sqrt{125}}{12\cdot\sqrt{75}} = ?$

Yanıt / The Answer is $\sqrt{5}$

60. $\dfrac{\sqrt{40}\cdot\sqrt{12}\cdot\sqrt{32}}{\sqrt{3}\cdot\sqrt{5}\cdot\sqrt{2}} = ?$

Yanıt / The Answer is $16\sqrt{2}$

61. $\dfrac{5\sqrt{3}}{3\sqrt{5}}\cdot\dfrac{\sqrt{180}}{\sqrt{300}} = ?$

Yanıt / The Answer is 1

62. $\sqrt[3]{4}\cdot\sqrt[3]{9}\cdot\sqrt[3]{6} = ?$

Yanıt / The Answer is 6

63. $\sqrt[5]{8}\cdot\sqrt[5]{-20} = ?$

Yanıt / The Answer is $-2\cdot\sqrt[5]{5}$

64. $\sqrt{3}\cdot\sqrt[6]{3} = ?$

Yanıt / The Answer is $\sqrt[3]{9}$

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65. $\sqrt[6]{2}\cdot\sqrt[3]{2}\cdot\sqrt{2}=?$

Yanıt / The Answer is 2

66. $\dfrac{\sqrt{2}\cdot\sqrt[3]{2}}{\sqrt[4]{2}}=?$

Yanıt / The Answer is $\sqrt[12]{2^7}$

67. $\sqrt{5}\cdot 5^{\frac{1}{3}}\cdot\sqrt[4]{5}=?$

Yanıt / The Answer is $5\cdot\sqrt[12]{5}$

68. $\sqrt[3]{5}\cdot\sqrt[4]{5}\cdot\sqrt[6]{5}=?$

Yanıt / The Answer is $5^{\frac{3}{4}}$

69. $\dfrac{\sqrt[4]{3}\cdot\sqrt[6]{27}}{\sqrt[3]{9}}=?$

Yanıt / The Answer is $3^{\frac{1}{12}}$

70. $\dfrac{\sqrt{12}\cdot\sqrt{8}\cdot\sqrt{6}}{\sqrt{2^6}\cdot\sqrt{3^2}}=?$

Yanıt / The Answer is 1

71. $\dfrac{\sqrt{10}\cdot(\sqrt{2{,}7}+\sqrt{14{,}7}-\sqrt{4{,}8})}{\sqrt{3}}=?$

Yanıt / The Answer is 6

72. $(\sqrt{3}-\sqrt{2})\cdot(\sqrt{3}+\sqrt{2})=?$

Yanıt / The Answer is 1

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73. $(\sqrt{6}-\sqrt{2})\cdot(\sqrt{6}+\sqrt{2}) = ?$

Yanıt / The Answer is 4

---

74. $\dfrac{3\sqrt{3}\cdot 3\sqrt{2}\cdot 3\sqrt{6}}{\sqrt{32+\sqrt{16}}} = ?$

Yanıt / The Answer is 27

---

75. $\left.\begin{array}{l} a = 3\sqrt[3]{x}+3\sqrt[3]{y} \\ b = 3\sqrt[3]{x}-3\sqrt[3]{y} \\ a^2-b^2 = 72 \end{array}\right\} \Rightarrow x\cdot y = ?$

Yanıt / The Answer is 8

---

76. $\sqrt{\sqrt{7}+\sqrt{3}}\cdot\sqrt{\sqrt{7}-\sqrt{3}} = ?$

Yanıt / The Answer is 2

---

77. $\sqrt{3-\sqrt{7}}\cdot\sqrt{3+\sqrt{7}}\cdot\sqrt{2} = ?$

Yanıt / The Answer is 2

---

78. $\sqrt[5]{\sqrt{33}-1}\cdot\sqrt[5]{\sqrt{33}+1} = ?$

Yanıt / The Answer is 2

---

79. $\sqrt[3]{\sqrt{6}-\sqrt{5}}\cdot\sqrt[3]{\sqrt{6}+\sqrt{5}} = ?$

Yanıt / The Answer is 1

---

80. $\sqrt[5]{\sqrt{19}-\sqrt{3}}\cdot\sqrt[5]{\sqrt{19}+\sqrt{3}}\cdot\sqrt[5]{2} = ?$

Yanıt / The Answer is 2

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81. $\frac{2}{\sqrt{2}}+\frac{1}{1-\sqrt{2}}=?$

Yanıt / The Answer is –1

82. $\left(\frac{8}{\sqrt{2}}+\frac{6}{\sqrt{3}}\right)\cdot\left(\frac{8}{\sqrt{2}}-\frac{6}{\sqrt{3}}\right)=?$

Yanıt / The Answer is 20

83. $2\sqrt{7}-\frac{7}{\sqrt{7}}=?$

Yanıt / The Answer is $\sqrt{7}$

84. $3\sqrt{3}-\frac{2}{\sqrt{3}}=?$

Yanıt / The Answer is $\frac{7\sqrt{3}}{3}$

85. $\sqrt{\frac{16}{3}}+\sqrt{\frac{3}{16}}+\frac{1}{4\sqrt{3}}=?$

Yanıt / The Answer is $\frac{5\sqrt{3}}{3}$

86. $a=2-\sqrt{2},\quad b=2+\sqrt{2}$

$\Rightarrow \frac{a\cdot b}{a-b}=?$

Yanıt / The Answer is $\frac{-\sqrt{2}}{2}$

87. $\frac{6}{\sqrt{7}-\sqrt{5}}-\frac{6}{\sqrt{7}+\sqrt{5}}=?$

Yanıt / The Answer is $6\sqrt{5}$

88. $\frac{10}{\sqrt{5}-\sqrt{3}}+\frac{10}{\sqrt{5}+\sqrt{3}}=?$

Yanıt / The Answer is $10\sqrt{5}$

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89. $\dfrac{8}{\sqrt{11}-\sqrt{7}}+\dfrac{8}{\sqrt{11}+\sqrt{7}}=?$

Yanıt / The Answer is $4\sqrt{11}$

90. $\dfrac{18}{6-3\sqrt{2}}-\dfrac{18}{6+3\sqrt{2}}=?$

Yanıt / The Answer is $6\sqrt{2}$

91. $\dfrac{1}{\sqrt{5}-2}-\dfrac{1}{\sqrt{5}+2}+3=?$

Yanıt / The Answer is 7

92. $\dfrac{5}{5+3\sqrt{3}}-\dfrac{5}{3\sqrt{3}-5}=?$

Yanıt / The Answer is –25

93. $\dfrac{\sqrt{3}}{\sqrt{5}+\sqrt{3}}-\dfrac{\sqrt{5}}{\sqrt{5}-\sqrt{3}}=?$

Yanıt / The Answer is –4

94. $\sqrt{\sqrt{3}}=?$

Yanıt / The Answer is $\sqrt[4]{3}$

95. $\sqrt{\sqrt[3]{5}}=?$

Yanıt / The Answer is $\sqrt[6]{5}$

96. $\sqrt[3]{\sqrt{\sqrt[3]{2}}}=?$

Yanıt / The Answer is $\sqrt[18]{2}$

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97. $\sqrt{\sqrt[6]{\sqrt[3]{5}}} = ?$

Yanıt / The Answer is $\sqrt[36]{5}$

98. $\sqrt{\sqrt[3]{4 \cdot \sqrt{2}}} = ?$

Yanıt / The Answer is $\sqrt[12]{32}$

99. $\sqrt[3]{3 \cdot \sqrt{\sqrt{3}}} = ?$

Yanıt / The Answer is $\sqrt[12]{243}$

100. $\sqrt{8 \cdot \sqrt{2^{-1} \cdot \sqrt{4^{-1}}}} = ?$

Yanıt / The Answer is 2

101. $\sqrt[4]{2 \cdot \sqrt[3]{2 \cdot \sqrt{2}}} = ?$

Yanıt / The Answer is $\sqrt[8]{8}$

102. $\sqrt[5]{x \cdot \sqrt{x \cdot \sqrt[3]{x^2}}} = x^m \Rightarrow$ **m = ?**

Yanıt / The Answer is $\frac{11}{30}$

103. $\sqrt[4]{a \cdot \sqrt{a^2 \cdot \sqrt[3]{a}}} = a^x \Rightarrow$ **x = ?**

Yanıt / The Answer is $\frac{13}{24}$

104. $\sqrt{5 + 2\sqrt{6}} = ?$

Yanıt / The Answer is $\sqrt{3} + \sqrt{2}$

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105. $\sqrt{6-2\sqrt{5}} = ?$

Yanıt / The Answer is $\sqrt{5} - 1$

106. $\sqrt{8-2\sqrt{15}} = ?$

Yanıt / The Answer is $\sqrt{5} - \sqrt{3}$

107. $\sqrt{15+2\sqrt{56}} = ?$

Yanıt / The Answer is $2\sqrt{2} + \sqrt{7}$

108. $\sqrt{8-\sqrt{60}} = ?$

Yanıt / The Answer is $\sqrt{5} - \sqrt{3}$

109. $\sqrt{7+\sqrt{48}} = ?$

Yanıt / The Answer is $2 + \sqrt{3}$

110. $\sqrt{10-4\sqrt{6}} = ?$

Yanıt / The Answer is $\sqrt{6} - 2$

111. $\sqrt{11-4\sqrt{6}} = ?$

Yanıt / The Answer is $2\sqrt{2} - \sqrt{3}$

112. $\sqrt{5\cdot\sqrt{5\cdot\sqrt{5\cdot\ldots}}} = ?$

Yanıt / The Answer is 5

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113. $\sqrt[3]{16\cdot\sqrt[3]{16\cdot\sqrt[3]{16\cdot\ldots}}} = ?$

Yanıt / The Answer is 4

114. $\sqrt{125 : \sqrt{125 : \sqrt{125 : \ldots}}} = ?$

Yanıt / The Answer is 5

115. $\dfrac{\sqrt[5]{2\cdot\sqrt[5]{2\cdot\sqrt[5]{2\cdot\ldots}}}}{\sqrt[3]{2 : \sqrt[3]{2 : \sqrt[3]{2 : \ldots}}}} = ?$

Yanıt / The Answer is 1

116. $\dfrac{\sqrt[6]{8\cdot\sqrt[6]{8\cdot\sqrt[6]{8\cdot\ldots}}}}{\sqrt[4]{4 : \sqrt[4]{4 : \sqrt[4]{4 : \ldots}}}} = ?$

Yanıt / The Answer is $\sqrt[5]{2}$

117. $\left(\sqrt[6]{8\cdot\sqrt[6]{8\cdot\sqrt[6]{8\cdot\ldots}}}\right)\cdot\left(\sqrt[4]{4 : \sqrt[4]{4 : \sqrt[4]{4 : \ldots}}}\right) = ?$

Yanıt / The Answer is 2

118. $\left(\sqrt[3]{25 : \sqrt[3]{25 : \sqrt[3]{25 : \ldots}}}\right)\cdot\left(\sqrt{5\cdot\sqrt{5\cdot\sqrt{5\cdot\ldots}}}\right) = ?$

Yanıt / The Answer is $5\sqrt{5}$

119. $\dfrac{\sqrt[3]{81 : \sqrt[3]{81 : \sqrt[3]{81 : \ldots}}}}{\sqrt{8 : \sqrt{8 : \sqrt{8 :}}}} = ?$

Yanıt / The Answer is $\dfrac{3}{2}$

120. $\sqrt{6+\sqrt{6+\sqrt{6+\ldots}}} = ?$

Yanıt / The Answer is 3

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121. $\sqrt{56+\sqrt{56+\sqrt{56\ldots}}} = ?$

Yanıt / The Answer is 8

122. $\sqrt{30-\sqrt{30-\sqrt{30\ldots}}} = ?$

Yanıt / The Answer is 5

123. $\sqrt{42-\sqrt{42-\sqrt{42\ldots}}} = ?$

Yanıt / The Answer is 6

124. $\left(\sqrt{12+\sqrt{12+\sqrt{12\ldots}}}\right)\cdot\left(\sqrt{90-\sqrt{90-\sqrt{90\ldots}}}\right) = ?$

Yanıt / The Answer is 36

125. $\dfrac{\sqrt{132+\sqrt{132+\sqrt{132}}}}{\sqrt{20-\sqrt{20-\sqrt{20}}}} = ?$

Yanıt / The Answer is 3

126. $\dfrac{\sqrt{210+\sqrt{210+\sqrt{210}}}}{\sqrt{30-\sqrt{30-\sqrt{30}}}} = ?$

Yanıt / The Answer is 3

127. $\sqrt{x-\sqrt{x-\sqrt{x\ldots}}} = 9 \Rightarrow x = ?$

Yanıt / The Answer is 90

128. $\left.\begin{array}{l}\sqrt{4^x} = 128\\ \sqrt{3^{2y}} = 81\\ \sqrt{16^z} = 16\end{array}\right\} \Rightarrow x+y+z = ?$

Yanıt / The Answer is 13

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1. $\sqrt{(-5)^2} - \sqrt[3]{(-4)^3} = ?$

A) 5 B) 6 C) 7 D) 8 E) 9

2. $\sqrt{72} + \sqrt{50} - \sqrt{32} = ?$

A) $6\sqrt{2}$ B) $7\sqrt{2}$ C) $8\sqrt{2}$ D) $9\sqrt{2}$ E) $10\sqrt{2}$

3. $\dfrac{\sqrt[3]{(-27)^2} - \sqrt{16}}{\sqrt{36} - \sqrt{4}} = ?$

A) $\frac{3}{4}$ B) 1 C) $\frac{5}{4}$ D) $\frac{3}{2}$ E) $\frac{7}{4}$

4. $\sqrt[3]{8} + \sqrt[4]{81} - \sqrt[3]{-27} = ?$

A) 6 B) 7 C) 8 D) 9 E) 10

5. $\sqrt{1 + \frac{9}{16}} + \sqrt{1 - \frac{9}{25}} = ?$

A) $\frac{41}{20}$ B) 2 C) $\frac{19}{10}$ D) $\frac{9}{5}$ E) $\frac{3}{2}$

6. $\sqrt{2 + \frac{1}{4}} + \sqrt{2 + \frac{7}{9}} = ?$

A) 3 B) $\frac{19}{6}$ C) $\frac{10}{3}$ D) $\frac{7}{2}$ E) $\frac{11}{3}$

7. $\sqrt{21 + \sqrt{13 + \sqrt{9}}} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

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8. $\sqrt{1,44} - \sqrt{0,04} + \sqrt[3]{0,064} = ?$

A) 1 B) $\frac{6}{5}$ C) $\frac{3}{2}$ D) $\frac{7}{5}$ E) $\frac{8}{5}$

9. $3\sqrt{8} + 2\sqrt{18} - 3\sqrt{32} = ?$

A) $3\sqrt{2}$ B) 0 C) $2\sqrt{2}$ D) $5\sqrt{2}$ E) $7\sqrt{2}$

10. $\sqrt{27} - \sqrt{48} + \sqrt{108} = ?$

A) $\sqrt{3}$ B) $3\sqrt{3}$ C) $5\sqrt{3}$ D) $7\sqrt{3}$ E) $9\sqrt{3}$

11. $3\sqrt{5} \cdot \sqrt{10} \cdot \sqrt{2} = ?$

A) 30 B) 27 C) 25 D) 21 E) 15

12. $\left.\begin{matrix}\sqrt{3} = x \\ \sqrt{5} = y\end{matrix}\right\} \Rightarrow \sqrt{135} = ?$

A) $x^3 \cdot y^2$ B) $x^3 \cdot y^3$ C) $x^2 \cdot y^3$ D) $x^2 \cdot y^2$ E) x^3y

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13. $(\sqrt{3} + \sqrt{5})^2 - \sqrt{60} = ?$

A) 3 B) 5 C) 7 D) 8 E) 10

14. $(\sqrt{6} - \sqrt{2})^2 + \sqrt{48} = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

15. $(\sqrt{5} + \sqrt{2})^2 + (\sqrt{5} - \sqrt{2})^2 = ?$

A) 7 B) 10 C) 14 D) 17 E) 21

16. $\sqrt{3x - 6} + \sqrt{x + y - 5} = 0 \Rightarrow x \cdot y = ?$

A) 1 B) 2 C) 3 D) 6 E) 12

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1	2	3	4	5	6	7	8
E	B	C	C	A	B	E	D
9	10	11	12	13	14	15	16
B	C	A	E	D	E	C	D

1. $\sqrt{18}+\sqrt{32}-\sqrt{8}=?$

A) $4\sqrt{2}$ B) $5\sqrt{2}$ C) $6\sqrt{2}$ D) $7\sqrt{2}$ E) $8\sqrt{2}$

2. $\dfrac{\sqrt{50}+\sqrt{72}}{\sqrt{8}-\sqrt{2}}=?$

A) 7 B) 8 C) 9 D) 10 E) 11

3. $\sqrt{72}-2\sqrt{8}+3\sqrt{50}=?$

A) $14\sqrt{2}$ B) $15\sqrt{2}$ C) $16\sqrt{2}$ D) $17\sqrt{2}$ E) $18\sqrt{2}$

4. $\dfrac{\sqrt[4]{(-4)^4}-\sqrt[3]{-8}-\sqrt{16}}{\sqrt[5]{-32}}=?$

A) –2 B) –1 C) 0 D) 1 E) 2

5. $\dfrac{1}{2+\sqrt{3}-\sqrt{7}}-\dfrac{1}{2+\sqrt{3}+\sqrt{7}}=?$

A) $\dfrac{\sqrt{3}}{12}$ B) $\dfrac{\sqrt{17}}{12}$ C) $\dfrac{\sqrt{5}}{6}$ D) $\dfrac{\sqrt{21}}{6}$ E) $\dfrac{\sqrt{24}}{12}$

6. $\dfrac{\sqrt{0,25}}{\sqrt{0,04}}+\dfrac{\sqrt{1,21}}{\sqrt{0,16}}=?$

A) $\dfrac{21}{4}$ B) $\dfrac{15}{4}$ C) $\dfrac{21}{2}$ D) $\dfrac{15}{2}$ E) $\dfrac{13}{2}$

7. $\dfrac{\sqrt{0,09}-0,09}{\sqrt{0,81}-0,81}=?$

A) $\dfrac{3}{7}$ B) $\dfrac{3}{5}$ C) $\dfrac{2}{7}$ D) $\dfrac{5}{3}$ E) $\dfrac{7}{3}$

8. $\sqrt{\dfrac{3^{-1}}{0,3}:\dfrac{0,3}{3}}=?$

A) $\dfrac{3}{10}$ B) $\dfrac{3}{5}$ C) $\dfrac{5}{3}$ D) $\dfrac{10}{3}$ E) $\dfrac{12}{5}$

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9. $\dfrac{\sqrt{1,44} - \sqrt[3]{0,125}}{\sqrt[4]{0,0016}} = ?$

A) $\frac{5}{2}$ B) $\frac{7}{2}$ C) $\frac{9}{2}$ D) $\frac{13}{2}$ E) $\frac{15}{2}$

10. $\dfrac{\sqrt[3]{(-5)^3} + \sqrt[4]{(-3)^4} - \sqrt[5]{(-2)^5}}{\sqrt[3]{(-8)}} = ?$

A) –4 B) –2 C) 0 D) 2 E) 4

11. $\sqrt{5 + \sqrt{11 + \sqrt{12 + \sqrt{169}}}} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

12. $\sqrt[3]{\sqrt{\sqrt[4]{8}}} = 2^x \Rightarrow x = ?$

A) $\frac{1}{8}$ B) $\frac{1}{6}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

13. $\sqrt{149^2 - 140^2} = ?$

A) 42 B) 45 C) 48 D) 51 E) 54

14. $A = \sqrt{12^2 + 3^4 + 24 \cdot 3^2} \Rightarrow 5A = ?$

A) 45 B) 65 C) 75 D) 85 E) 105

15. $\sqrt[7]{8^4 + 4^6 + 2^{12} + 16^3} = ?$

A) 2 B) 4 C) 6 D) 8 E) 10

16. $\sqrt{a,\overline{b}} = 1,\overline{3} \Rightarrow a + b = ?$

A) 4 B) 6 C) 8 D) 10 E) 12

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1	2	3	4	5	6	7	8
B	E	D	B	D	A	E	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	C	C	A	D	E	B	C

1. $\sqrt{33^2+44^2+132^2} = ?$

A) 120 B) 124 C) 132 D) 143 E) 144

2. $\sqrt{\left(\dfrac{9^{-5}}{9^{-2}+9^{-3}}\right)^{-1}} = ?$

A) $3\sqrt{10}$ B) $5\sqrt{10}$ C) $6\sqrt{10}$ D) $8\sqrt{10}$ E) $9\sqrt{10}$

3. $\sqrt{\dfrac{25}{36}+1+\dfrac{9}{25}} = ?$

A) $\dfrac{25}{36}$ B) $\dfrac{23}{30}$ C) $\dfrac{43}{30}$ D) $\dfrac{43}{36}$ E) $\dfrac{47}{30}$

4. $\sqrt{1995^2-1994\cdot1996} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

5. $\sqrt{\dfrac{36}{49}+\dfrac{1}{16}-\dfrac{3}{7}} = ?$

A) $\dfrac{13}{28}$ B) $\dfrac{15}{28}$ C) $\dfrac{17}{28}$ D) $\dfrac{19}{28}$ E) $\dfrac{21}{28}$

6. $\sqrt{2002\cdot1996+9} = ?$

A) 1997 B) 1998 C) 1999 D) 2000 E) 2001

7. $\sqrt{\dfrac{9}{25}+\dfrac{1}{4}-\dfrac{3}{5}} = ?$

A) $\dfrac{1}{10}$ B) $\dfrac{1}{8}$ C) $\dfrac{1}{6}$ D) $\dfrac{1}{5}$ E) $\dfrac{1}{3}$

8. $\sqrt{999\cdot1001-1004\cdot996} = ?$

A) $2\sqrt{5}$ B) $\sqrt{15}$ C) $3\sqrt{6}$ D) $2\sqrt{15}$ E) $4\sqrt{5}$

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9. $\dfrac{\sqrt{3}+3\sqrt{12}-2\sqrt{48}}{\sqrt{27}-\sqrt{75}}=?$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 1 E) 2

10. $\sqrt{\dfrac{0,0108}{0,03}}-\sqrt{\dfrac{0,003}{0,3}}=?$

A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{4}$ D) $\frac{4}{5}$ E) $\frac{5}{6}$

11. $\sqrt[3]{\dfrac{a^2}{\sqrt{a}}}=3 \Rightarrow a=?$

A) 3 B) 4 C) 5 D) 8 E) 9

12. $A=\dfrac{\sqrt[3]{12-x}-\sqrt[4]{x-4}+\sqrt{4-x}}{\sqrt{x+5}+x-5} \Rightarrow A=?$

A) 1 B) 2 C) 3 D) 4 E) 5

13. $\sqrt{3x-1}+\sqrt{2y-3}=0$

$\Rightarrow 4y-12x=?$

A) –2 B) –1 C) 0 D) 1 E) 2

14. $\dfrac{\sqrt{32^x}\cdot\sqrt{8^x}}{\sqrt{2^x}}=2^{14} \Rightarrow x=?$

A) 1 B) 2 C) 3 D) 4 E) 5

15. $\dfrac{\sqrt{3^{2a+3b}}}{\sqrt{9^{a-2b}}}=3^7 \Rightarrow b=?$

A) 1 B) 2 C) 3 D) 4 E) 5

16. $\dfrac{7\cdot\sqrt{243}}{\sqrt{147}}=3^{x-4} \Rightarrow x=?$

A) 2 B) 3 C) 4 D) 5 E) 6

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1	2	3	4	5	6	7	8
D	E	C	A	C	C	A	B
9	10	11	12	13	14	15	16
C	A	E	A	E	D	B	E

1. $\sqrt{2+\frac{1}{4}}+\sqrt{5+\frac{9}{8}}-\sqrt{5+\frac{1}{16}}=?$

A) $\frac{7\sqrt{2}-3}{4}$ B) $\frac{6\sqrt{2}-5}{2}$ C) $\frac{4\sqrt{2}-2}{3}$ D) $\frac{7\sqrt{2}+3}{4}$ E) $\frac{7\sqrt{2}-4}{3}$

2. $\frac{\sqrt{35}+\sqrt{15}}{\sqrt{14}+\sqrt{6}} : \frac{\sqrt[3]{4}}{\sqrt[3]{25}}=?$

A) $\frac{1}{2}$ B) 1 C) $\frac{5}{2}$ D) $\sqrt{\frac{5}{2}}$ E) $\frac{5}{2}\sqrt[6]{\frac{5}{2}}$

3. $\left(\sqrt{\frac{5}{3}}+\sqrt{\frac{10}{3}}-2\right):\left(\sqrt{5}+\sqrt{10}-2\sqrt{3}\right)=?$

A) $-\sqrt{3}$ B) 1 C) $\frac{\sqrt{3}}{3}$ D) $\sqrt{3}$ E) 3

4. $\sqrt{4+\sqrt{19-\sqrt{4^2-7}}}=?$

A) $\sqrt{2}$ B) $2\sqrt{2}$ C) $3\sqrt{2}$ D) $4\sqrt{2}$ E) $5\sqrt{2}$

5. $A=\sqrt{7}-\sqrt{2}+1$

$B=\sqrt{7}+\sqrt{2}-1$

$\Rightarrow A^2+B^2+2AB=?$

A) 4 B) 12 C) 16 D) 28 E) 36

6. $\frac{\sqrt{2}\cdot\sqrt{3}\cdot\ldots\cdot\sqrt{10}}{\sqrt{4}\cdot\sqrt{6}\cdot\ldots\cdot\sqrt{20}}=?$

A) $\frac{\sqrt{2}}{64}$ B) $\frac{\sqrt{2}}{32}$ C) $\frac{\sqrt{2}}{16}$ D) $\frac{\sqrt{2}}{8}$ E) $\frac{\sqrt{2}}{4}$

7. $\sqrt[3]{100^{2x+1}}=10^2 \Rightarrow x=?$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $\frac{3}{\sqrt{x}}+\frac{5}{2\sqrt{x}}+\frac{2}{\sqrt{x}}=\frac{45}{2} \Rightarrow x=?$

A) $\frac{1}{3}$ B) $\frac{\sqrt{3}}{3}$ C) $\sqrt{3}$ D) 3 E) $\frac{1}{9}$

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9. $\sqrt{2x-8}+\sqrt{3y-9}=0 \Rightarrow$ **x · y = ?**

A) 2 B) 6 C) 8 D) 10 E) 12

10. $(x+y-12)^6+\sqrt[6]{x-y-2}=0 \Rightarrow$ **x · y = ?**

A) 5 B) 15 C) 20 D) 30 E) 35

11. $\sqrt{a}\cdot\sqrt[3]{a^2}\cdot\sqrt[4]{a^3}=a^x \Rightarrow$ **x = ?**

A) $\frac{19}{12}$ B) $\frac{5}{3}$ C) $\frac{7}{4}$ D) $\frac{11}{6}$ E) $\frac{23}{12}$

12. $\sqrt{2}\cdot\sqrt{3}\cdot\ldots\cdot\sqrt{x}=6\sqrt{20} \Rightarrow$ **x = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

13. $\dfrac{\sqrt{x-4\sqrt{2}}+x^2}{x-\sqrt{4\sqrt{2}-x}}=?$

A) $\sqrt{2}$ B) $2\sqrt{2}$ C) $3\sqrt{2}$ D) $4\sqrt{2}$ E) $5\sqrt{2}$

14. $\left.\begin{array}{l} x=\sqrt[3]{5} \\ y=\sqrt[4]{9} \\ z=\sqrt[6]{10} \end{array}\right\} \Rightarrow$ **? > ? > ?**

A) x > y > z B) x > z > y C) y > x > z D) y > z > x E) z > x > y

15. $\left.\begin{array}{l} a=\sqrt[3]{\frac{1}{9}} \\ b=\sqrt{\frac{1}{27}} \\ c=\sqrt[4]{\frac{1}{3}} \end{array}\right\} \Rightarrow$ **? > ? > ?**

A) a > b > c B) a > c > b C) b > a > c D) b > c > a E) c > a > b

16. $\left.\begin{array}{l} a=\left(3^{\sqrt{3}}\right)^{2\sqrt{2}} \\ b=\left(\left(\sqrt{3}\right)^{3}\right)^{2} \\ c=\left(9^{\sqrt{3}}\right)^{2} \end{array}\right\} \Rightarrow$ **? > ? > ?**

A) a > b > c B) a > c > b C) b > a > c D) b > c > a E) c > a > b

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1	2	3	4	5	6	7	8
A	E	C	B	D	B	A	E
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
E	E	E	B	D	C	E	E

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1. $\sqrt{(-4)^2} + \sqrt[3]{-8} - \sqrt{16} = ?$

A) –4 B) –2 C) 0 D) 2 E) 4

2. $x \in Z,\ A \in R,$

$\sqrt{x+6} + \sqrt{8-x} = A \Rightarrow \sum x = ?$

A) 10 B) 11 C) 12 D) 14 E) 15

3. $\dfrac{\sqrt{4-x} + \sqrt{x}}{\sqrt{20-x} - \sqrt{x-4}} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 4

4. $\left(\sqrt{100} + \sqrt[3]{125} - \sqrt[4]{16}\right) \cdot \sqrt{(-2)^2} = ?$

A) 6 B) 9 C) 12 D) 13 E) 26

5. $\left(\sqrt{80} + \sqrt{45} - \sqrt{500}\right) \cdot \sqrt{20} = ?$

A) –30 B) –25 C) –20 D) –15 E) –10

6. $\left(\sqrt{0,01} + \sqrt{0,04} + \sqrt{0,09}\right) : \sqrt{0,36} = ?$

A) 1 B) $\sqrt{2}$ C) $\sqrt{3}$ D) 2 E) 3

7. $\left.\begin{array}{l} \sqrt[5]{8} = 2^a \\ \sqrt[3]{9} = 3^b \end{array}\right\} \Rightarrow a \cdot b = ?$

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) 1

8. $\sqrt[4]{27^{x-1}} = \sqrt[3]{9^{x+2}} \Rightarrow x = ?$

A) 25 B) 24 C) 23 D) 22 E) 21

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9. $\dfrac{\sqrt{2}+\sqrt{4}+\ldots+\sqrt{28}}{\sqrt{3}+\sqrt{6}+\ldots+\sqrt{42}}=\sqrt{x} \Rightarrow x=?$

A) 1 B) 2 C) $\sqrt{2}$ D) $\frac{2}{3}$ E) $\frac{4}{9}$

10. $\dfrac{(\sqrt{5}-1)\cdot(\sqrt{5}+1)}{\sqrt{10}-\sqrt{5}}\cdot\dfrac{\sqrt{2}-1}{\sqrt{5}}=?$

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) 1

11. $\dfrac{\sqrt{10}-\sqrt{5}+5}{1-\sqrt{2}-\sqrt{5}}=?$

A) $-\sqrt{5}$ B) $-\sqrt{2}$ C) 2 D) $\sqrt{2}$ E) $\sqrt{5}$

12. $\dfrac{a}{\sqrt{2}+1}+\dfrac{b}{\sqrt{2}-1}=4\sqrt{2}+6 \Rightarrow b=?$

A) 1 B) 2 C) 3 D) 4 E) 5

13. $\dfrac{\sqrt{1{,}69}+\sqrt{0{,}49}}{\sqrt{1{,}44}-\sqrt{0{,}04}}=?$

A) 1 B) $\sqrt{2}$ C) 2 D) $\sqrt{3}$ E) 3

14. $\left(\dfrac{1}{\sqrt{5}-2}+\dfrac{1}{\sqrt{5}+2}\right)\cdot\sqrt{5}=?$

A) 1 B) $\sqrt{5}$ C) $2\sqrt{5}$ D) 5 E) 10

15. $\left[\left(\sqrt{(4-\sqrt{10})^2}\right)-\left(\sqrt{(\sqrt{10}-4)^2}\right)\right]\cdot\sqrt{10}=?$

A) 0 B) 1 C) $\sqrt{10}$ D) $2\sqrt{5}$ E) $2\sqrt{10}$

16. $\dfrac{(\sqrt[8]{a-1}-\sqrt[8]{a+1})\cdot(\sqrt[8]{a-1}+\sqrt[8]{a+1})}{\sqrt{a-1}-\sqrt{a+1}}=\dfrac{1}{\sqrt[4]{3}+\sqrt[4]{5}}$

$\Rightarrow a=?$

A) 2 B) 3 C) 4 D) 5 E) 6

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1	2	3	4	5	6	7	8
B	E	B	E	A	A	B	A
9	10	11	12	13	14	15	16
D	D	A	E	C	E	A	C

1. $x \in Z,\ A \in R,$

$\sqrt{x+5} + \sqrt{7-x} = A \Rightarrow \sum x = ?$

A) 10 B) 12 C) 13 D) 15 E) 18

2. $A \in R,$

$\sqrt{x-2} + \sqrt[4]{2-x} + \sqrt[3]{-8} - 3x = A \Rightarrow \mathbf{A = ?}$

A) –10 B) –8 C) –6 D) 4 E) 6

3. $\sqrt{(-7)^2} + \sqrt[3]{-64} + \sqrt{(3-\pi)^2} = ?$

A) $3-\pi$ B) $1-\pi$ C) $-\pi$ D) π E) $\pi+3$

4. $\sqrt{2^{x-1}} = \sqrt[5]{8^{x+2}} \Rightarrow x = ?$

A) –17 B) –15 C) 13 D) 15 E) 17

5. $\sqrt[3]{25^{x-2}} = \sqrt[4]{125^{x-7}} \Rightarrow x = ?$

A) 39 B) 42 C) 45 D) 47 E) 53

6. $\sqrt{0{,}75} + \sqrt{0{,}48} - \sqrt{1{,}08} = ?$

A) $\frac{\sqrt{3}}{10}$ B) $\frac{\sqrt{3}}{5}$ C) $\frac{3\sqrt{3}}{10}$ D) $\frac{2\sqrt{3}}{5}$ E) $\frac{\sqrt{3}}{2}$

7. $\left(\sqrt{48} + \sqrt{75} - \sqrt{192}\right) \cdot 2\sqrt{3} = ?$

A) 6 B) $4\sqrt{3}$ C) $6\sqrt{3}$ D) $8\sqrt{3}$ E) 16

8. $\left(\sqrt[3]{16} + \sqrt[3]{54} - \sqrt[3]{128}\right) \cdot \sqrt[3]{4} = ?$

A) 1 B) 2 C) $\sqrt[3]{4}$ D) $\sqrt[3]{6}$ E) $2 \cdot \sqrt[3]{4}$

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9. $\dfrac{\sqrt{3}\cdot\sqrt[3]{2}}{\sqrt[6]{3}} = ?$

A) $\sqrt[6]{6}$ B) $\sqrt[6]{3}$ C) $\sqrt[6]{2}$ D) $\sqrt[3]{3}$ E) $\sqrt[3]{6}$

10. $\sqrt{2}\cdot(\sqrt{18}-1)\cdot(6+\sqrt{2}) = ?$

A) 28 B) 30 C) 32 D) 34 E) 36

11. $\dfrac{\sqrt[3]{5}\cdot\sqrt{2}}{\sqrt[6]{2}} : \dfrac{1}{\sqrt[3]{100}} = ?$

A) $\sqrt[6]{10}$ B) $\sqrt[3]{10}$ C) $\sqrt{10}$ D) 10 E) 100

12. $\dfrac{\sqrt{1{,}44}+\sqrt{0{,}25}}{\sqrt{0{,}9}-\sqrt{0{,}4}}\cdot\sqrt{10} = ?$

A) 10 B) 17 C) $10\sqrt{10}$ D) $17\sqrt{10}$ E) $23\sqrt{10}$

13. $\dfrac{\sqrt{6}-\sqrt{3}+3}{\sqrt{3}+\sqrt{2}-1} = ?$

A) $\sqrt{3}-1$ B) $\sqrt{2}-1$ C) $\sqrt{3}-\sqrt{2}$ D) $\sqrt{3}$ E) $\sqrt{2}$

14. $\dfrac{1}{\sqrt{3}+1}-\dfrac{1}{\sqrt{3}-1} = ?$

A) -2 B) -1 C) $-\dfrac{1}{2}$ D) $\dfrac{1}{2}$ E) 1

15. $\dfrac{4}{\sqrt{2}+1}+\dfrac{4}{\sqrt{2}}-\dfrac{6}{\sqrt{2}-1} = ?$

A) -10 B) -8 C) $-4\sqrt{2}$ D) $-2\sqrt{2}$ E) $-\sqrt{2}$

16. $\dfrac{17}{3\sqrt{2}+1}-\dfrac{7}{2\sqrt{2}-1} = ?$

A) $\sqrt{2}-4$ B) $\sqrt{2}-3$ C) $\sqrt{2}-2$ D) $\sqrt{2}-1$ E) $\sqrt{2}$

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1	2	3	4	5	6	7	8
C	B	D	A	D	C	A	B
9	10	11	12	13	14	15	16
E	D	D	B	D	B	A	C

1. $\sqrt{3^{x-1}} = a \Rightarrow \sqrt{3^{x+3}} = ?$

A) 3a B) 5a C) 6a D) 8a E) 9a

2. $\sqrt{\dfrac{3^{x+2}+3^{x-1}}{3^{x+2}-2\cdot 3^{x}}} = ?$

A) $\sqrt{3}$ B) $2\sqrt{3}$ C) $\frac{2\sqrt{3}}{3}$ D) $\frac{3\sqrt{3}}{2}$ E) $\frac{4\sqrt{3}}{3}$

3. $\sqrt[4]{\sqrt[3]{x}} = \sqrt[4]{8} \cdot \sqrt[6]{32} \Rightarrow x = ?$

A) 2^{15} B) 2^{16} C) 2^{17} D) 2^{18} E) 2^{19}

4. $x^{-\frac{4}{3}} + 1 = 17 \Rightarrow x = ?$

A) $\frac{1}{8}$ B) $\frac{1}{6}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

5. $5^{a+2} = 225 \Rightarrow \sqrt{125^{a}} + \sqrt[3]{3\cdot 5^{a}} = ?$

A) 15 B) 20 C) 25 D) 30 E) 35

6. $\sqrt[x]{\dfrac{9^{x+1}-3^{2x}}{8\cdot 3^{x}}} = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

7. $x, y \in Z^{+}$

$\left.\begin{array}{l} \sqrt[x]{2^{y}} = \sqrt[y]{512^{x}} \\ x + y = 24 \end{array}\right\} \Rightarrow x = ?$

A) 4 B) 6 C) 8 D) 12 E) 16

8. $\sqrt{a^{3}-8} + \sqrt{2b-16} = 0 \Rightarrow a + b = ?$

A) 10 B) 12 C) 14 D) 16 E) 18

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9. $\sqrt{x\cdot\sqrt{x}} = 125 \Rightarrow \sqrt{x+\sqrt{x}} = ?$

A) $3\sqrt{10}$ B) $3\sqrt{13}$ C) $5\sqrt{13}$ D) $3\sqrt{26}$ E) $5\sqrt{26}$

10. $\sqrt[3]{\frac{x^2}{y}\sqrt{\frac{y}{x}\sqrt{\frac{x}{y}}}} \cdot \sqrt[12]{\frac{y^3}{x}} = ?$

A) $\sqrt{\frac{x}{y}}$ B) $\sqrt{\frac{y}{x}}$ C) $\sqrt{x}$ D) $\sqrt[3]{\frac{y}{x}}$ E) $\sqrt{x\cdot y}$

11. $\sqrt[3]{4\sqrt{2}} = \left(\frac{1}{32}\right)^x \Rightarrow x = ?$

A) $-\frac{1}{6}$ B) $-\frac{1}{4}$ C) $-\frac{1}{2}$ D) $\frac{1}{4}$ E) $\frac{1}{6}$

12. $\sqrt[5]{3\cdot\sqrt[4]{32}} = \sqrt[5]{3}\cdot\sqrt[4]{x} \Rightarrow x = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 2 D) 3 E) 4

13. $\frac{2}{\sqrt{5}-\sqrt{3}} - \frac{2}{\sqrt{5}+\sqrt{3}} = ?$

A) $\sqrt{3}$ B) $2\sqrt{3}$ C) $\sqrt{5}$ D) $2\sqrt{5}$ E) $\sqrt{5}-\sqrt{3}$

14. $\left.\begin{array}{l}\sqrt{\left(3-\sqrt{5}\right)^2} = A \\ \sqrt{\left(\sqrt{5}-4\right)^2} = B\end{array}\right\} \Rightarrow B - A = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

15. $\frac{\sqrt{18}}{\sqrt{2}} + \frac{2}{2-\sqrt{5}} + \frac{8}{\sqrt{5}+1} = ?$

A) -3 B) -2 C) $\sqrt{2}$ D) $\sqrt{3}$ E) $\sqrt{5}$

16. $\frac{5}{\sqrt{\left(\sqrt{2}-\sqrt{7}\right)^2}} + \frac{14}{\sqrt{7}} - \sqrt{2} = ?$

A) $\sqrt{2}$ B) $2\sqrt{2}$ C) $\sqrt{7}$ D) $2\sqrt{7}$ E) $3\sqrt{7}$

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1	2	3	4	5	6	7	8
E	C	E	A	D	B	B	A
9	10	11	12	13	14	15	16
E	C	A	C	B	D	A	E

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1. $\dfrac{\sqrt{(-3)^2} - \sqrt[3]{(-4)^3}}{\sqrt[4]{16} - 1} = ?$

A) –1 B) 1 C) 2 D) 5 E) 7

2. $\dfrac{\sqrt{(-2)^8} + \sqrt[3]{-2^6}}{\sqrt[4]{(-2)^{-4}}} = ?$

A) 8 B) 12 C) 24 D) 36 E) 48

3. $\sqrt{1 - \dfrac{5}{9}} + \sqrt{2 + \dfrac{7}{9}} - \sqrt{1 - \dfrac{17}{81}} = ?$

A) $\dfrac{7}{9}$ B) $\dfrac{8}{9}$ C) $\dfrac{10}{9}$ D) $\dfrac{13}{9}$ E) $\dfrac{14}{9}$

4. $\left(\dfrac{\sqrt{15} + \sqrt{10}}{3 + \sqrt{6}}\right) : \dfrac{\sqrt{5}}{3} = ?$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) $\sqrt{5}$ D) $\dfrac{3\sqrt{3}}{5}$ E) $\dfrac{5\sqrt{3}}{3}$

5. $\dfrac{\sqrt{14,4} + \sqrt{6,4}}{\sqrt{12,1} - \sqrt{3,6}} = ?$

A) 2 B) 4 C) 5 D) 8 E) 10

6. $\sqrt{(3-\sqrt{7})^2} - \sqrt{(2-\sqrt{7})^2} + \sqrt{28} = ?$

A) 1 B) $1 - 4\sqrt{7}$ C) $5 - \sqrt{7}$ D) $5 - 4\sqrt{7}$ E) 5

7. $3 \cdot \sqrt[4]{25} + \sqrt{\dfrac{45}{4}} - \dfrac{1}{2}\sqrt{20} = ?$

A) $\dfrac{3\sqrt{5}}{2}$ B) $5\sqrt{5}$ C) $\dfrac{7\sqrt{5}}{2}$ D) $7\sqrt{5}$ E) $\dfrac{9\sqrt{5}}{2}$

8. $\left(\sqrt{0,3\overline{9}} - \sqrt{8,1}\right) \cdot \sqrt{10} = ?$

A) –9 B) –7 C) –5 D) –3 E) $-\sqrt{10}$

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9. $\sqrt[3]{1+\frac{19}{8}}-\sqrt{2-\frac{2}{9}}+\sqrt{3+\frac{1}{16}}=?$

A) $\frac{23}{12}$ B) $\frac{7}{6}$ C) $\frac{19}{12}$ D) $\frac{5}{4}$ E) $\frac{3}{2}$

10. $\frac{\sqrt[4]{16^{x+4}}}{\sqrt[3]{2^{6x+3}}}=\frac{1}{8} \Rightarrow x=?$

A) –2 B) –1 C) 1 D) 3 E) 6

11. $\sqrt[3]{4^x}=\sqrt{\frac{8^x}{4}} \Rightarrow x=?$

A) $\frac{6}{5}$ B) $\frac{5}{4}$ C) $\frac{4}{3}$ D) $\frac{3}{2}$ E) 1

12. $x=\sqrt[4]{5}$, $y=\sqrt[3]{4}$, $z=\sqrt[6]{12} \Rightarrow ?<?<?$

A) $x<z<y$ B) $x<y<z$ C) $y<x<z$ D) $y<z<x$ E) $z<x<y$

13. $x=\sqrt[3]{\frac{1}{4}}$, $y=\sqrt[4]{\frac{1}{32}}$, $z=\sqrt[5]{\frac{1}{64}} \Rightarrow ?<?<?$

A) $x<y<z$ B) $z<x<y$ C) $y<z<x$ D) $x<z<y$ E) $y<x<z$

14. $\frac{2}{\sqrt{3}-1}+\frac{3}{\sqrt{3}+2}+\frac{6}{\sqrt{3}}=?$

A) 7 B) 3 C) $3\sqrt{3}$ D) $5\sqrt{3}$ E) $7\sqrt{3}$

15. $\left(\sqrt{\frac{3}{2}}-\sqrt{\frac{2}{3}}-2\sqrt{6}\right):\frac{1}{\sqrt{6}}=?$

A) –18 B) –12 C) –11 D) –9 E) –8

16. $\frac{2}{\sqrt{x}}+\frac{\sqrt{x}}{2}=\sqrt{x} \Rightarrow x=?$

A) 2 B) 4 C) 6 D) 8 E) 10

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1	2	3	4	5	6	7	8
E	C	D	B	B	E	C	B
9	10	11	12	13	14	15	16
A	E	A	A	C	A	C	B

1. $\sqrt{x} + 2\sqrt{x} + 3\sqrt{x} = 24 \Rightarrow$ **x = ?**

A) 2 B) 4 C) 16 D) 32 E) 64

2. $\dfrac{\sqrt[3]{3} \cdot \sqrt[6]{3} \cdot \sqrt{3}}{\sqrt[5]{3} \cdot \sqrt[5]{81}} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

3. $\sqrt{x} \cdot \sqrt[3]{x} \cdot \sqrt[3]{x^2} = 8 \Rightarrow$ **x = ?**

A) 2 B) 4 C) 6 D) 8 E) 16

4. $\sqrt{x} + 2\sqrt{x} + 3\sqrt{x} = 24 \Rightarrow$ **x = ?**

A) 2 B) 4 C) 16 D) 32 E) 64

5. $\sqrt{\sqrt{7} - \sqrt{3}} \cdot \sqrt{\sqrt{7} + \sqrt{3}} = ?$

A) 5 B) 4 C) 3 D) 2 E) 1

6. $\sqrt{\sqrt{6} - \sqrt{3}} \cdot \sqrt{\sqrt{6} + \sqrt{3}} \cdot \sqrt{3} = ?$

A) 3 B) 6 C) 9 D) 12 E) 15

7. $\sqrt{3 - 2\sqrt{2}} = ?$

A) $\sqrt{2}$ B) $2\sqrt{2}$ C) $3\sqrt{2}$ D) $\sqrt{2} + 1$ E) $\sqrt{2} - 1$

8. $\sqrt{11 - \sqrt{72}} \cdot (3 + \sqrt{2}) = ?$

A) 3 B) 5 C) 7 D) 9 E) 12

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9. $\sqrt{12+8\sqrt{2}} = ?$

A) $2\sqrt{2}$ B) $2+2\sqrt{2}$ C) $3\sqrt{2}$ D) $3+2\sqrt{2}$ E) $5+2\sqrt{2}$

10. $\sqrt{4-\sqrt{15}}\cdot(\sqrt{5}+\sqrt{3}) = ?$

A) $\sqrt{2}$ B) $2\sqrt{2}$ C) $3\sqrt{2}$ D) $4\sqrt{2}$ E) $5\sqrt{2}$

11. $\sqrt{5+\sqrt{21}} = ?$

A) $\dfrac{\sqrt{7}+1}{\sqrt{2}}$ B) $\dfrac{\sqrt{3}+1}{\sqrt{2}}$ C) $\dfrac{\sqrt{2}}{\sqrt{7}+\sqrt{3}}$ D) $\dfrac{\sqrt{7}-\sqrt{2}}{\sqrt{3}}$ E) $\dfrac{\sqrt{7}+\sqrt{3}}{\sqrt{2}}$

12. $\sqrt{20+\sqrt{20+\sqrt{20\ldots}}} = ?$

A) 1 B) 5 C) 10 D) 15 E) 20

13. $\sqrt{30+\sqrt{30+\sqrt{30\ldots}}} = ?$

A) 1 B) 3 C) 5 D) 6 E) 7

14. $\sqrt{x+\sqrt{x+\sqrt{x\ldots}}} = 6 \Rightarrow x = ?$

A) 10 B) 20 C) 30 D) 40 E) 50

15. $\sqrt{x-\sqrt{x-\sqrt{x\ldots}}} = 5 \Rightarrow x = ?$

A) 10 B) 20 C) 30 D) 40 E) 50

16. $\dfrac{\sqrt{9-6\sqrt{2}}}{\sqrt{3}} = ?$

A) $6-\sqrt{2}$ B) $3-\sqrt{3}$ C) $\sqrt{6}-\sqrt{2}$ D) $(\sqrt{2}-1)$ E) $3(\sqrt{2}-1)$

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1	2	3	4	5	6	7	8
C	A	B	C	D	A	E	C
9	10	11	12	13	14	15	16
B	A	E	B	D	C	C	D

1. $\sqrt{55-\sqrt{38-\sqrt[3]{6+\sqrt{4}}}} = ?$

A) 5 B) 6 C) 7 D) 8 E) 9

2. $\sqrt[3]{24+\sqrt{5+\sqrt{18+\sqrt[3]{-8}}}} = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

3. $\sqrt[n]{\sqrt[n-1]{x}} = \sqrt[36]{\dfrac{1}{x^{-3}}} \Rightarrow n = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

4. $a = \sqrt{x \cdot \sqrt[3]{x \cdot \sqrt{\dfrac{1}{x}}}}$

$b = \sqrt[3]{x^2 \cdot \sqrt{\dfrac{1}{x} \cdot \sqrt{x}}} \Rightarrow \dfrac{a}{b} = ?$

A) 1 B) $x^{\frac{1}{12}}$ C) $x^{\frac{1}{6}}$ D) $x^{\frac{1}{4}}$ E) $x^{\frac{1}{3}}$

5. $\sqrt{2 \cdot \sqrt[3]{4 \cdot \sqrt{\dfrac{1}{2}}}} = 8^{x-1} \Rightarrow x = ?$

A) $\dfrac{5}{2}$ B) $\dfrac{5}{3}$ C) $\dfrac{5}{4}$ D) 1 E) $\dfrac{5}{6}$

6. $\sqrt[3]{\left(\dfrac{1}{9}\right)^{-x}} = \dfrac{\sqrt{27^x}}{3} \Rightarrow x = ?$

A) $\dfrac{4}{5}$ B) 1 C) $\dfrac{6}{5}$ D) $\dfrac{7}{5}$ E) $\dfrac{8}{5}$

7. $\sqrt{2x-3} + \sqrt{8x-12} = 21 \Rightarrow x = ?$

A) 25 B) 26 C) 27 D) 28 E) 29

8. $x = \dfrac{1,96}{0,14} \Rightarrow \sqrt{x+11} = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

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9. $\dfrac{2}{3\sqrt{2}-1}-\dfrac{2}{3\sqrt{2}+1}=?$

A) $\dfrac{3}{5}$ B) $\dfrac{4}{5}$ C) $\dfrac{2}{17}$

D) $\dfrac{3}{17}$ E) $\dfrac{4}{17}$

10. $\sqrt{1+\sqrt{7-2\sqrt{6}}}=A \Rightarrow$ **$A^8=?$**

A) $\sqrt{6}$ B) 6 C) 12 D) 36 E) 48

11. $\dfrac{\sqrt{2}}{\sqrt{2}+\sqrt{5}}+\dfrac{\sqrt{5}}{\sqrt{2}-\sqrt{5}}=?$

A) $-\dfrac{7}{3}$ B) $-\dfrac{5}{3}$ C) $-\dfrac{2}{3}$

D) $\dfrac{2}{3}$ E) $\dfrac{5}{3}$

12. $\left.\begin{array}{l} A=\sqrt{13+\sqrt{4+\sqrt{25}}} \\ B=\dfrac{\sqrt{15}\cdot\sqrt{3}}{\sqrt{5}} \end{array}\right\} \Rightarrow$ **$A+B=?$**

A) 4 B) 5 C) 6 D) 7 E) 8

13. $\dfrac{\sqrt{10+4\sqrt{6}}}{\sqrt{2}}-\sqrt{2}=?$

A) $\sqrt{3}$ B) $\sqrt{2}$ C) 1 D) 2 E) 3

14. $\sqrt[4]{7+2\sqrt{12}}\cdot\sqrt{2-\sqrt{3}}=?$

A) $\sqrt[4]{2}$ B) $\sqrt{2}$ C) 1 D) 2 E) 4

15. $\sqrt{x+2012}+\sqrt{x-2008}=2010$
$\sqrt{x+2012}-\sqrt{x-2008}=B \Rightarrow$ **$B=?$**

A) 1 B) 2 C) 3 D) 4 E) 5

16. $\dfrac{\sqrt[3]{4\cdot\sqrt[3]{4\cdot\sqrt[3]{4\ldots}}}}{\sqrt[3]{2\cdot\sqrt{2}}}=?$

A) $3\sqrt{2}$ B) $\sqrt{2}$ C) $\sqrt[3]{4}$

D) $\dfrac{1}{2}$ E) 2

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1	2	3	4	5	6	7	8
C	B	D	A	C	C	B	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
E	D	A	D	A	C	B	B

1. $x = \frac{\sqrt{3}}{2} + 1 \Rightarrow x \cdot (x-2) = ?$

A) $-\frac{1}{4}$ B) $-\frac{1}{2}$ C) 1 D) 2 E) 4

2. $\left.\begin{aligned}\sqrt{a} &= \sqrt{3}-1\\ \sqrt{b} &= \sqrt{3}+1\end{aligned}\right\} \Rightarrow a+b=?$

A) 2 B) 4 C) 6 D) 8 E) 10

3. $a = 0,\overline{3}$ ve (and) $b = 0,\overline{1}$

$\Rightarrow \frac{\sqrt{1+\frac{1}{a}} + \sqrt{\frac{1}{b}}}{\sqrt{3ab}} = ?$

A) 10 B) 12 C) 15 D) 18 E) 20

4. $\left.\begin{aligned}x+y &= 12\\ x \cdot y &= 16\end{aligned}\right\} \Rightarrow \sqrt{\frac{x}{y}} - \sqrt{\frac{y}{x}} = ?$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) $\sqrt{5}$ D) $\sqrt{7}$ E) $\sqrt{10}$

5. $\frac{4\sqrt{x} - 3\sqrt{y}}{\sqrt{x} + \sqrt{y}} = 3 \Rightarrow \frac{x}{y} = ?$

A) 12 B) 18 C) 24 D) 30 E) 36

6. $\frac{a}{b} + \frac{b}{a} = 4 \Rightarrow \sqrt{22 + \frac{a^2}{b^2} + \frac{b^2}{a^2}} = ?$

A) 3 B) 6 C) 9 D) 12 E) 15

7. $\left.\begin{aligned}x &= \sqrt{3}+1\\ y &= \sqrt{3}-1\end{aligned}\right\} \Rightarrow \left(\frac{x+y}{xy}\right)^2 = ?$

A) 3 B) 4 C) 6 D) 7 E) 12

8. $\left.\begin{aligned}\frac{a}{b} &= 2\\ a+c &= 25\\ b+c &= 15\end{aligned}\right\} \Rightarrow \sqrt{b^2+a+1} = ?$

A) 5 B) 6 C) 9 D) 11 E) 12

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9. $\dfrac{a+b}{\sqrt{4ab+25}} = 1 \Rightarrow |a-b| = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

10. $2^x - 2^{-x} = 4\sqrt{2}$

$\Rightarrow \sqrt{4^x + 4^{-x} + 2} = ?$

A) 5 B) 6 C) 9 D) 10 E) 15

11. $\left.\begin{array}{l}\sqrt[3]{b^2+11} = 3 \\ \sqrt{a^2-4} = b\end{array}\right\} \Rightarrow a^2 + b^2 = ?$

A) 20 B) 24 C) 28 D) 32 E) 36

12. $a^x - a^{-x} = 4$

$\Rightarrow 3\sqrt{2}\sqrt{a^{2x} + a^{-2x}} = ?$

A) 9 B) 12 C) 16 D) 18 E) 24

13. $\left.\begin{array}{l}a > 0 \\ a + \sqrt{x} = 2 \\ b + 4\sqrt{x} = 9\end{array}\right\} \Rightarrow (4a-b)^2 = ?$

A) 1 B) 4 C) 9 D) 16 E) 25

14. $x - \dfrac{\sqrt{3}}{x} = 4 \Rightarrow 4x^2 - 16x - 2\sqrt{3} = ?$

A) $\sqrt{3}$ B) $2\sqrt{3}$ C) $3\sqrt{3}$ D) $4\sqrt{3}$ E) $5\sqrt{3}$

15. $\dfrac{21 + \sqrt{4a-3}}{4a + \sqrt{3-4a}} = ?$

A) 3 B) 5 C) 7 D) 9 E) 12

16. $a > 0,$

$\sqrt{24+a} + \sqrt{a} = 6 \Rightarrow \sqrt{24+a} - \sqrt{a} = ?$

A) 2 B) 3 C) 4 D) 6 E) 8

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1	2	3	4	5	6	7	8
A	D	C	C	E	B	A	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	B	E	D	A	B	C	C

1. $a > 2,$

$a^2 - 4a + 2 = 0 \Rightarrow \sqrt{\dfrac{a^4+4}{12a^2}} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

2. $a, b \in R^+,$

$\left.\begin{array}{l}\sqrt{a} - \sqrt{b} = 3\\ a - b = 21\end{array}\right\} \Rightarrow 2a + 3b = ?$

A) 42 B) 48 C) 52 D) 54 E) 62

3. $\left.\begin{array}{l}\dfrac{a \cdot b}{c} = 4\\ \dfrac{a \cdot c}{b} = 3\\ \dfrac{b \cdot c}{a} = 1\end{array}\right\} \Rightarrow \sqrt{a^2 + c^2 + 1} = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

4. $\sqrt{4 - 2\sqrt{3}} + \sqrt{7 - 4\sqrt{3}} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

5. $(\sqrt{3} + \sqrt{2}) \cdot \sqrt{5 - 2\sqrt{6}} = ?$

A) 1 B) $\sqrt{2}$ C) $\sqrt{3}$ D) 2 E) $\sqrt{6}$

6. $\left.\begin{array}{l}A = \sqrt{6} + \sqrt{5}\\ B = \sqrt{6} - \sqrt{5}\end{array}\right\} \Rightarrow \dfrac{A}{B} + \dfrac{B}{A} = ?$

A) 11 B) 14 C) 16 D) 18 E) 22

7. $\left.\begin{array}{l}x = 2 - \sqrt{3}\\ y = 2 + \sqrt{3}\end{array}\right\} \Rightarrow \sqrt{x^2 - 2xy + y^2} = ?$

A) $\sqrt{2}$ B) $2\sqrt{2}$ C) $\sqrt{3}$ D) $2\sqrt{3}$ E) 5

8. $\dfrac{\sqrt{6} - \sqrt{3}}{\sqrt{6} + \sqrt{3}} + \dfrac{4}{\sqrt{2}} = ?$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) 3 D) 4 E) $2\sqrt{3}$

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9. $\left.\begin{array}{l} A=\sqrt{3}-\sqrt{2} \\ B=\sqrt{3}+\sqrt{2} \end{array}\right\} \Rightarrow \dfrac{A^2+B^2}{A\cdot B}=?$

A) 6 B) 8 C) 10 D) 12 E) 14

10. $\sqrt{7-\sqrt{45}}+\sqrt{7+\sqrt{45}}=?$

A) $2\sqrt{2}$ B) $3\sqrt{2}$ C) $2\sqrt{3}$ D) $3\sqrt{3}$ E) $4\sqrt{2}$

11. $\dfrac{2}{\sqrt{3+\sqrt{8}}}-\dfrac{2}{\sqrt{3-\sqrt{8}}}=?$

A) –4 B) –2 C) 0 D) 2 E) 4

12. $\dfrac{\sqrt{3}+1}{\sqrt{15}+\sqrt{5}+\sqrt{3}+1}=?$

A) $\sqrt{3}+1$ B) $\sqrt{3}-1$ C) $\sqrt{5}-1$ D) $\sqrt{5}+1$ E) $\dfrac{\sqrt{5}-1}{4}$

13. $\dfrac{10}{\sqrt{6}+1}+\dfrac{4}{\sqrt{6}-2}-\dfrac{12}{3-\sqrt{6}}=?$

A) –10 B) –5 C) $-\sqrt{6}$ D) 5 E) $\sqrt{6}$

14. $\dfrac{1}{\sqrt{4+2\sqrt{3}}}-\dfrac{1}{\sqrt{4-2\sqrt{3}}}=?$

A) –2 B) –1 C) 0 D) 1 E) 2

15. $\left.\begin{array}{l} a=\sqrt[2]{3} \\ b=\sqrt[3]{4} \\ c=\sqrt[6]{6} \end{array}\right\} \Rightarrow\ ? < ? < ?$

A) c < b < a B) b < c < a C) c < a < b D) a < c < b E) a < b < c

16. $\dfrac{4}{\sqrt[3]{25}+\sqrt[3]{5}+1}=?$

A) $\sqrt[3]{5}$ B) $\sqrt[3]{5}-1$ C) $\sqrt[3]{5}+1$ D) $\sqrt[3]{5}-2$ E) $\sqrt[3]{5}+2$

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1	2	3	4	5	6	7	8
A	E	C	A	A	E	D	C
9	10	11	12	13	14	15	16
C	B	A	E	A	B	A	B

1. $\sqrt{7+\sqrt{45}}\cdot(3-\sqrt{5}) = ?$

A) $\sqrt{2}$ B) $2\sqrt{2}$ C) $4\sqrt{2}$ D) $6\sqrt{2}$ E) $8\sqrt{2}$

2. $\sqrt{4-2\sqrt{3}}+\sqrt{4+2\sqrt{3}}-\sqrt{3} = ?$

A) $-2\sqrt{3}$ B) $-\sqrt{3}$ C) 0 D) $\sqrt{3}$ E) $2\sqrt{3}$

3. $\left.\begin{array}{l} x = 2\sqrt{3}-1 \\ y = 2\sqrt{3}+1 \end{array}\right\} \Rightarrow x^2-y^2 = ?$

A) $-8\sqrt{3}$ B) $-6\sqrt{3}$ C) $-4\sqrt{3}$ D) $6\sqrt{2}$ E) $8\sqrt{3}$

4. $\left.\begin{array}{l} 4a-b = 60 \\ 2\sqrt{a}-\sqrt{b} = 6 \end{array}\right\} \Rightarrow a+b = ?$

A) 20 B) 30 C) 40 D) 50 E) 60

5. $\dfrac{\sqrt{x}+\sqrt{2x}}{\sqrt{y}+\sqrt{2y}}-\dfrac{y-\sqrt{xy}}{\sqrt{xy}-x} = ?$

A) $\dfrac{x-y}{\sqrt{x\cdot y}}$ B) $\dfrac{x-y}{x\cdot y}$ C) $\dfrac{x+y}{\sqrt{x\cdot y}}$ D) $\dfrac{x+y}{x\cdot y}$ E) $\dfrac{\sqrt{x\cdot y}}{x-y}$

6. $\sqrt{2-\sqrt{x}}+1 = \sqrt{2+\sqrt{x}} \Rightarrow x = ?$

A) $\frac{4}{5}$ B) $\frac{4}{7}$ C) $\frac{3}{7}$ D) $\frac{7}{4}$ E) $\frac{7}{3}$

7. $x, y \in \mathbb{R}$,

$x\sqrt{2}+y\sqrt{3} = \dfrac{\sqrt{6}+1}{\sqrt{3}} \Rightarrow x+y = ?$

A) $\frac{2}{3}$ B) $\frac{3}{4}$ C) $\frac{3}{2}$ D) $\frac{4}{3}$ E) $\frac{5}{2}$

8. $(\sqrt{5}+\sqrt{2})^3\cdot(\sqrt{15}-\sqrt{6})^3 = ?$

A) $9\sqrt{3}$ B) $27\sqrt{3}$ C) $36\sqrt{3}$ D) $72\sqrt{3}$ E) $81\sqrt{3}$

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9. $\sqrt{3}+1=a \Rightarrow \left(3+\sqrt{3}\right)^4 = ?$

A) $3a^2$ B) $3a^4$ C) $9a^2$ D) $9a^4$ E) $81a^4$

10. $\sqrt{72+\sqrt{72+\sqrt{72}}}\ldots = x \Rightarrow x = ?$

A) 3 B) 4 C) 7 D) 8 E) 9

11. $\sqrt{x-\sqrt{x-\sqrt{x\ldots}}} = 6 \Rightarrow x = ?$

A) 30 B) 36 C) 42 D) 48 E) 54

12. $\sqrt[3]{16\cdot\sqrt[3]{16\cdot\sqrt[3]{16\ldots}}} = x$

$\sqrt[4]{32:\sqrt[4]{32:\sqrt[4]{32\ldots}}} = y$

$\Rightarrow \sqrt{x+y^2} = ?$

A) 3 B) 6 C) 9 D) 12 E) 15

13. $\left(\sqrt{6-2\sqrt{4+2\sqrt{3}}}\right)\cdot\left(\sqrt{3}+1\right) = ?$

A) $\sqrt{2}$ B) $\sqrt{3}$ C) 2 D) $\sqrt{6}$ E) 4

14. $\sqrt[3]{n\cdot\sqrt[3]{n\cdot\sqrt[3]{n\ldots}}} + \sqrt{3\sqrt{3\ldots}} = 5 \Rightarrow n = ?$

A) 3 B) 4 C) 5 D) 6 E) 9

15. $A = \sqrt{5\sqrt{2\sqrt{5\sqrt{2\ldots}}}} \Rightarrow A = ?$

A) $\sqrt[4]{30}$ B) $\sqrt[4]{50}$ C) $\sqrt[3]{50}$ D) $\sqrt[3]{30}$ E) $\sqrt{30}$

16. $\sqrt{30+\sqrt{30+\sqrt{30\ldots}}} = x^2 - x \Rightarrow \sum x = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

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1	2	3	4	5	6	7	8
B	D	A	A	A	D	D	E
9	10	11	12	13	14	15	16
D	E	C	B	C	B	C	D

1. $\sqrt[3]{a^2\cdot\sqrt{a\cdot\sqrt{\frac{1}{a}}}} = a^x \Rightarrow$ **x = ?**

A) $\frac{1}{4}$ B) $\frac{3}{4}$ C) 1 D) $\frac{9}{4}$ E) $\frac{11}{4}$

2. $\sqrt[3]{2\cdot\sqrt[3]{2\cdot\sqrt{2^x}}} = 16 \Rightarrow$ **x = ?**

A) 8 B) 16 C) 32 D) 64 E) 128

3. $\sqrt[3]{x^2\cdot\sqrt{x\cdot\sqrt[3]{x^2}}} = \sqrt[9]{2^{17}} \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

4. $\left(\frac{3}{\sqrt{3}}+2\right)\cdot\left(\sqrt{3}-2\right) = ?$

A) –1 B) –3 C) 0 D) 1 E) 3

5. $\frac{1}{\sqrt{3}-\sqrt{2}}+\frac{1}{\sqrt{3}+\sqrt{2}} = ?$

A) $\sqrt{3}$ B) $2\sqrt{3}$ C) $3\sqrt{3}$ D) $4\sqrt{3}$ E) $5\sqrt{3}$

6. $\frac{1}{\sqrt{4-\sqrt{12}}}+\frac{1}{\sqrt{4+2\sqrt{3}}} = ?$

A) $\sqrt{2}$ B) $3\sqrt{2}$ C) $\sqrt{3}$ D) $2\sqrt{3}$ E) $4\sqrt{3}$

7. $\frac{8}{\sqrt{2}}-\frac{1}{\sqrt{2}-1}+\frac{1}{\sqrt{2}+1} = ?$

A) $4\sqrt{2}-2$ B) $3\sqrt{2}-2$ C) $3\sqrt{2}$ D) $4\sqrt{2}$ E) $2-4\sqrt{2}$

8. $\sqrt{\frac{1}{9}+\frac{1}{4}+\frac{1}{3}} = ?$

A) $-\frac{1}{6}$ B) $-\frac{5}{6}$ C) 0 D) $\frac{1}{6}$ E) $\frac{5}{6}$

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9. $\sqrt[8]{\dfrac{3^7+3^7+3^7}{4^3+4^3+4^3+4^3}} = ?$

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

10. $\sqrt[6]{32\cdot\sqrt[6]{32\cdot\sqrt[6]{32\ldots}}} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

11. $\sqrt[3]{16 : \sqrt[3]{16 : \sqrt[3]{16\ldots}}} = ?$

A) 6 B) 5 C) 4 D) 3 E) 2

12. $\sqrt[4]{32 : \sqrt[4]{32 : \sqrt[4]{32\ldots}}} = ?$

A) 2 B) 4 C) 6 D) 8 E) 16

13. $\left.\begin{array}{l}\sqrt{6+\sqrt{6+\sqrt{6+\sqrt{6\ldots}}}} = x\\ \sqrt{27 : \sqrt{27 : \sqrt{27}}} = y\end{array}\right\} \Rightarrow x+y=?$

A) 3 B) 6 C) 9 D) 12 E) 15

14. $\left.\begin{array}{l}\sqrt{2}=a\\ \sqrt[3]{3}=b\end{array}\right\} \Rightarrow a^4b^6=?$

A) 6 B) 12 C) 24 D) 36 E) 72

15. $\dfrac{\sqrt{111^2+222^2+333^2}}{37\sqrt{14}} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

16. $\dfrac{2}{2-\sqrt{2}} - \dfrac{4}{2\sqrt{2}} = ?$

A) 1 B) $\sqrt{2}$ C) 2 D) $\sqrt{5}$ E) 4

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1	2	3	4	5	6	7	8
B	D	D	A	B	C	A	E
9	10	11	12	13	14	15	16
B	B	E	A	B	D	C	C

1. $x \in Z,\ A \in R,$
$A = \sqrt[4]{3 - |x - 4|} \Rightarrow \sum x = ?$

A) 7 B) 14 C) 18 D) 21 E) 28

2. $\sqrt{2} = a,\ \sqrt{3} = b,\ \sqrt{5} = c \Rightarrow \sqrt{240} = ?$

A) abc B) a^2bc C) ab^2c D) a^3bc E) a^4bc

3. $\sqrt{7+\sqrt{24}} - \sqrt{8-4\sqrt{3}} = ?$

A) $1-\sqrt{2}$ B) $1+\sqrt{2}$ C) $\sqrt{6}$ D) $2\sqrt{6}$ E) $\sqrt{6}-\sqrt{2}$

4. $A = \sqrt{7+2\sqrt{12}} \Rightarrow A + \frac{1}{A} = ?$

A) 2 B) 4 C) $2\sqrt{3}$ D) $2+\sqrt{3}$ E) $2-\sqrt{3}$

5. $\sqrt{2012 \cdot 2014 + 1} = ?$

A) 2012 B) 2013 C) 2014 D) 2015 E) 2016

6. $\sqrt{\frac{1}{144} - \frac{1}{30} + \frac{1}{25}} = ?$

A) $-\frac{7}{60}$ B) $-\frac{7}{30}$ C) $\frac{7}{15}$ D) $\frac{7}{30}$ E) $\frac{7}{60}$

7. $\dfrac{1}{\sqrt{3} - \dfrac{1}{1 + \dfrac{1}{\sqrt{3}}}} = ?$

A) $\sqrt{3}-1$ B) $\sqrt{3}+1$ C) $\frac{\sqrt{3}+1}{2}$ D) $\frac{\sqrt{3}+1}{3}$ E) $\frac{\sqrt{3}-1}{2}$

8. $\sqrt{\frac{\sqrt{2}-1}{\sqrt{2}+1}} - \sqrt{\frac{\sqrt{2}+1}{\sqrt{2}-1}} = ?$

A) −2 B) −1 C) $-2\sqrt{2}$ D) 2 E) $2\sqrt{2}$

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9. $\dfrac{\sqrt[4]{0{,}0016}+\sqrt[3]{0{,}027}}{\sqrt{0{,}49}-\sqrt[5]{32\cdot 10^{-5}}}=?$

A) -1 B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) 1 E) 2

10. $\left(3\sqrt{3}\right)^{\sqrt{x}}=\left(\sqrt[3]{9}\right)^{\sqrt{5}} \Rightarrow x=?$

A) $\frac{80}{81}$ B) $\frac{40}{81}$ C) $\frac{20}{9}$ D) $\frac{10}{9}$ E) $\frac{8}{9}$

11. $\sqrt{x-\sqrt{x-\sqrt{x\ldots}}}=4$
$\sqrt{y+\sqrt{y+\sqrt{y\ldots}}}=8 \Rightarrow \dfrac{x}{y}=?$

A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{4}{7}$ D) $\frac{5}{8}$ E) $\frac{5}{14}$

12. $\sqrt{2:\sqrt{2:\sqrt{2:\ldots}}}=A$
$\sqrt[4]{54\cdot\sqrt[4]{54\cdot\sqrt[4]{54\ldots}}}=B \Rightarrow \dfrac{A}{B}=?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{\sqrt{2}}$ D) $\frac{1}{\sqrt{3}}$ E) $\frac{1}{\sqrt{6}}$

13. $\sqrt[3]{27x-27}-\sqrt[3]{1-x}=8 \Rightarrow x=?$

A) 8 B) 9 C) 16 D) 27 E) 32

14. $\dfrac{2}{\dfrac{\sqrt{a}}{\sqrt{b}}-1}-\dfrac{2}{1-\dfrac{\sqrt{b}}{\sqrt{a}}}=?$

A) -2 B) -1 C) $\sqrt{a}$ D) $\sqrt{b}$ E) $\sqrt{a}-\sqrt{b}$

15. $\dfrac{2\sqrt{2}+2\sqrt{2}}{\sqrt[3]{4}+\sqrt[3]{4}}=A \Rightarrow A^6=?$

A) 4 B) 8 C) 16 D) 32 E) 64

16. $x+\sqrt{x}=4 \Rightarrow x+\dfrac{4}{\sqrt{x}}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

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1	2	3	4	5	6	7	8
E	E	B	B	B	E	D	A
9	10	11	12	13	14	15	16
D	A	E	B	B	A	D	E

1. $\dfrac{18+\sqrt{3-x}}{x+\sqrt{x-3}} = ?$

A) 1 B) 2 C) 3 D) 6 E) 8

2. $a^2 = 5+2\sqrt{6} \Rightarrow a\cdot(\sqrt{3}-\sqrt{2}) = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

3. $\sqrt{12+2\sqrt{11}}\cdot(\sqrt{11}-1) = ?$

A) 4 B) 6 C) 8 D) 9 E) 10

4. $4^a = 3 \Rightarrow 2^{5a} = ?$

A) $3\sqrt{3}$ B) $5\sqrt{3}$ C) $9\sqrt{3}$ D) $12\sqrt{3}$ E) $15\sqrt{3}$

5. $\sqrt{\dfrac{9}{16}+\dfrac{1}{2}+\dfrac{1}{9}} = ?$

A) $\dfrac{10}{9}$ B) $\dfrac{11}{10}$ C) $\dfrac{12}{11}$ D) $\dfrac{13}{12}$ E) $\dfrac{14}{13}$

6. $\sqrt{\dfrac{25}{144}-\dfrac{5}{14}+\dfrac{9}{49}} = ?$

A) $\dfrac{1}{49}$ B) $\dfrac{1}{56}$ C) $\dfrac{1}{70}$ D) $\dfrac{1}{77}$ E) $\dfrac{1}{84}$

7. $\sqrt[6]{\sqrt{5}-1}\cdot\sqrt{\sqrt{5}+1}\cdot\sqrt[3]{\sqrt{5}-1} = ?$

A) 2 B) 4 C) 5 D) 6 E) 7

8. $\sqrt{2}+\sqrt{4}+\sqrt{6}+\ldots+\sqrt{48}+\sqrt{50} = A$
$\Rightarrow 1+\sqrt{2}+\sqrt{3}+\ldots+\sqrt{24}+\sqrt{25} = ?$

A) $\dfrac{A\sqrt{2}}{2}$ B) $A\sqrt{2}$ C) $\dfrac{A}{2}$ D) $\dfrac{A\sqrt{2}}{4}$ E) $\dfrac{A\sqrt{2}}{8}$

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9. $\sqrt{973 \cdot 977 + 4} = ?$

A) 675 B) 775 C) 875 D) 975 E) 1075

10. $\dfrac{\sqrt{5+2\sqrt{6}}}{\sqrt{2}+\sqrt{3}} = ?$

A) 1 B) 3 C) 5 D) 7 E) 9

11. $\dfrac{1}{\sqrt{5-2\sqrt{6}}} - \dfrac{1}{\sqrt{5+2\sqrt{6}}} = ?$

A) $\sqrt{2}$ B) $2\sqrt{2}$ C) $4\sqrt{2}$ D) $5\sqrt{2}$ E) $6\sqrt{2}$

12. $(\sqrt{7}-1)\cdot\left(1+\dfrac{3\sqrt{7}}{7}+\dfrac{4}{\sqrt{7}}\right) = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

13. $\dfrac{\sqrt{1,69}-\sqrt{0,16}}{\sqrt{0,25}+\sqrt{0,16}} = ?$

A) 5 B) 4 C) 3 D) 2 E) 1

14. $x < 0 < y \Rightarrow \sqrt{(x-y)^2} + \sqrt{x^2} + \sqrt{y^2} = ?$

A) $y - x$ B) $x - y$ C) $x + y$ D) $2(y - x)$ E) $2(y + x)$

15. $\sqrt{\dfrac{1}{25}+\dfrac{1}{9}-\dfrac{2}{15}} = ?$

A) $\dfrac{1}{15}$ B) $\dfrac{2}{15}$ C) $\dfrac{1}{5}$ D) $\dfrac{4}{15}$ E) $\dfrac{2}{5}$

16. $x > 0$

$\sqrt{4x^2-4}+\sqrt{x^2-1} = 9 \Rightarrow x = ?$

A) 2 B) $\sqrt{3}$ C) 3 D) $\sqrt{5}$ E) $\sqrt{10}$

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1	2	3	4	5	6	7	8
D	A	E	C	D	E	A	A
9	10	11	12	13	14	15	16
D	A	B	E	E	D	B	E

1. $\sqrt{\sqrt[4]{3}-1}\cdot\sqrt{\sqrt[4]{3}+1}\cdot\sqrt{\sqrt{3}+1} = ?$

A) $\sqrt{3}-1$ B) $\sqrt{3}$ C) $\sqrt{2}$ D) 1 E) 2

2. $2 \le x < 3$,
$\sqrt{x^2-6x+9}-\sqrt{x^2-4x+4}=x-1$

$\Rightarrow$ **x = ?**

A) 2 B) $\frac{5}{2}$ C) $\frac{5}{3}$ D) $\frac{7}{3}$ E) $\frac{9}{4}$

3. $\sqrt{x\sqrt[3]{x^2}} = \sqrt[3]{x\cdot\sqrt{\left(\frac{1}{x}\right)^m}} \Rightarrow$ **m = ?**

A) –5 B) –3 C) –2 D) 2 E) 3

4. $\left(\sqrt{2}+\frac{1}{\sqrt{2}-1}\right) : \left(\sqrt{2}-\frac{1}{\sqrt{2}+1}\right) = ?$

A) $2+\sqrt{2}$ B) $-\frac{\sqrt{2}}{2}$ C) $\frac{4-\sqrt{2}}{2}$ D) $\frac{4+\sqrt{2}}{2}$ E) $\frac{6+\sqrt{2}}{2}$

5. $\sqrt{2}\cdot x-1 = x+\sqrt{2} \Rightarrow x^2-6x+9 = ?$

A) $\sqrt{2}-1$ B) $\sqrt{2}+1$ C) $2\sqrt{2}-1$ D) $2\sqrt{2}$ E) 8

6. $\sqrt{\frac{1}{36}+\frac{1}{4}-\frac{1}{6}} = ?$

A) $-\frac{1}{2}$ B) $-\frac{1}{3}$ C) $\frac{1}{3}$ D) $\frac{1}{2}$ E) $\frac{1}{6}$

7. $\frac{2}{\sqrt{5-\sqrt{24}}}-\frac{2}{\sqrt{5+\sqrt{24}}} = ?$

A) $-4\sqrt{3}$ B) $-2\sqrt{3}$ C) $2\sqrt{2}$ D) $4\sqrt{2}$ E) $2\sqrt{3}-2\sqrt{2}$

8. $\sqrt{3+\sqrt{5}}-\sqrt{3-\sqrt{5}} = ?$

A) $\frac{\sqrt{2}}{2}$ B) $\sqrt{2}$ C) $2\sqrt{2}$ D) $3\sqrt{2}$ E) $\sqrt{2}-1$

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9. $A=\sqrt{32-\sqrt{42+\sqrt{42+\sqrt{42\ldots}}}}$

$B=\sqrt{45+\sqrt{20-\sqrt{20-\sqrt{20\ldots}}}} \Rightarrow \mathbf{A\cdot B=?}$

A) 32 B) 35 C) 42 D) 45 E) 54

10. $A=\sqrt{2\cdot\sqrt{3\cdot\sqrt{2\cdot\sqrt{3\ldots}}}}$

$B=\sqrt{3\cdot\sqrt{2\cdot\sqrt{3\cdot\sqrt{2\ldots}}}} \Rightarrow \mathbf{A\cdot B=?}$

A) 6 B) 8 C) 9 D) 12 E) 18

11. $\dfrac{\sqrt{5}}{\sqrt{15}-\sqrt{10}}-\dfrac{\sqrt{3}}{3+\sqrt{6}}=?$

A) $-2\sqrt{3}$ B) $-2\sqrt{2}$ C) 0 D) $2\sqrt{2}$ E) $2\sqrt{3}$

12. $\dfrac{x-3}{\sqrt{x}+\sqrt{3}}-\left(\sqrt{x}+\sqrt{3}\right)=?$

A) $-2\sqrt{x}$ B) $-2\sqrt{3}$ C) $2\sqrt{x}$ D) $\sqrt{3}$ E) $2\sqrt{3}$

13. $\sqrt{x\cdot\sqrt[3]{x\cdot\sqrt{x}}}=8$

$\dfrac{x}{y}=2 \Rightarrow \mathbf{x+y=?}$

A) 6 B) 12 C) 15 D) 18 E) 24

14. $\sqrt{3+\sqrt{x}}-\sqrt{3-\sqrt{x}}=\sqrt{2} \Rightarrow \mathbf{x=?}$

A) 3 B) 4 C) 5 D) 6 E) 8

15. $a=\sqrt[4]{8}$, $b=\sqrt[3]{4}$, $c=\sqrt[12]{128}$

$\Rightarrow$ **? < ? < ?**

A) $b<a<c$ B) $a<b<c$ C) $c<a<b$ D) $c<b<a$ E) $b<c<a$

16. $\sqrt[3]{3\sqrt[3]{3^{x+3}}}=3^{x-2} \Rightarrow \mathbf{x=?}$

A) 3 B) 4 C) 5 D) 6 E) 7

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1	2	3	4	5	6	7	8
C	A	B	D	E	C	D	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	A	D	B	E	C	D	A

METROPOL YAYINLARI • METROPOL PUBLICATIONS

1. $\sqrt{3+2\sqrt{2}}+\sqrt{3-2\sqrt{2}}=?$

A) $\sqrt{2}$ B) 2 C) $2\sqrt{2}$ D) $2\sqrt{2}+2$ E) 0

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

2. $\dfrac{\sqrt{3}+1}{\sqrt{3}}-\dfrac{1-\sqrt{3}}{\sqrt{3}}=?$

A) $\dfrac{2\sqrt{3}}{3}$ B) $\dfrac{2}{3}$ C) 0 D) 2 E) $\sqrt{3}$

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

3. $\sqrt{75}+\sqrt{108}-\sqrt{48}=?$

A) $\sqrt{231}$ B) $\sqrt{135}$ C) $15\sqrt{3}$ D) $7\sqrt{3}$ E) 0

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

4. $a=\sqrt{2}-1 \Rightarrow a^2+3a-10=?$

A) $\sqrt{2}$ B) $\sqrt{2}-10$ C) $\sqrt{2}+10$ D) $2\sqrt{2}-5$ E) $\sqrt{2}+1$

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

5. $3\cdot\sqrt{32}-\sqrt{27}+\sqrt{3}-\sqrt{2}=?$

A) $2\sqrt{2}-11\sqrt{3}$ B) $2\sqrt{2}+\sqrt{3}$ C) $11\sqrt{2}-2\sqrt{3}$ D) $11\sqrt{2}-\sqrt{3}$ E) $11\sqrt{2}+\sqrt{3}$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2017]

6. $\left(\dfrac{1}{a+\sqrt{b}}-\dfrac{1}{a-\sqrt{b}}\right)\cdot\left(\dfrac{a^2-b}{\sqrt{b}}\right)=?$

A) –1 B) –2 C) 1 D) $\dfrac{a}{\sqrt{b}}$ E) $\dfrac{\sqrt{a}}{b}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS-2017]

7. $\dfrac{a}{b}\cdot\sqrt{\dfrac{b}{a}\cdot\sqrt{\left(\dfrac{a}{b}\right)^3}}=?$

A) $\sqrt[4]{\left(\dfrac{a}{b}\right)^5}$ B) $\sqrt[3]{\left(\dfrac{a}{b}\right)^4}$ C) $\sqrt{\left(\dfrac{a}{b}\right)^3}$ D) $\sqrt{\dfrac{a}{b}}$ E) $\dfrac{a}{b}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS-2017]

8. $\dfrac{\sqrt{16}-\sqrt{9}+\sqrt{25}}{\sqrt{0,81}+\sqrt[3]{0,027}}=?$

A) 1 B) 2 C) 3 D) 5 E) 10

[ERCİYES ÜNİVERSİTESİ – YÖS 2017]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $\sqrt[3]{\dfrac{3^4+3^4+3^4+3^4}{2^5+2^5+2^5}}=?$

A) 0,6 B) 1 C) 1,2 D) 1,5 E) 1,8

[ERCİYES ÜNİVERSİTESİ – YÖS 2017]

10. $\left.\begin{aligned} a&=\sqrt{7}-\sqrt{3} \\ b&=\sqrt{7}+\sqrt{3}\end{aligned}\right\} \Rightarrow \dfrac{a}{b}+\dfrac{b}{a}=?$

A) –3 B) –1 C) 0 D) 1 E) 5

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

11. $\dfrac{\sqrt{40}-\sqrt{32}}{\sqrt{5}-2}-\dfrac{2}{\sqrt{2}}=?$

A) $\sqrt{5}$ B) $\sqrt{3}$ C) $\sqrt{2}$ D) 0 E) $-2\sqrt{2}$

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

12. $x\cdot\sqrt{0,08}=2 \Rightarrow x=?$

A) $\sqrt{2}$ B) $3\sqrt{2}$ C) $5\sqrt{2}$ D) $7\sqrt{2}$ E) $8\sqrt{2}$

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

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13. $\sqrt{9-6\sqrt{2}}=?$

A) $6-\sqrt{2}$ B) $3-\sqrt{3}$ C) $\sqrt{6}-\sqrt{2}$ D) $\sqrt{3}(\sqrt{2}-1)$ E) $3(\sqrt{2}-1)$

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

14. $\sqrt{2,25}+\sqrt[3]{0,027}-6\cdot\sqrt[4]{0,0081}=?$

A) 6 B) 2 C) 9 D) 0 E) 7

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

15. $\sqrt[3]{4\sqrt{2\sqrt[4]{8}}}=?$

A) $2^{\frac{3}{4}}$ B) $2^{\frac{19}{24}}$ C) $2^{\frac{5}{6}}$ D) $2^{\frac{7}{8}}$ E) $2^{\frac{23}{24}}$

[BALIKESİR ÜNİVERSİTESİ – YÖS 2017]

16. $\sqrt{4+\sqrt{7}}-\sqrt{4-\sqrt{7}}=?$

A) –3 B) $2\sqrt{3}$ C) $2\sqrt{5}$ D) $\sqrt{2}$ E) 2

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	D	D	B	C	B	A	D
9	10	11	12	13	14	15	16
D	E	C	C	D	D	E	D

BÖLÜM CHAPTER 5

TARİHSEL NOT / HISTORICAL NOTE

Atiyah, Sir Michael Francis [1929 –]

Topoloji, Geometri, Analiz, cebirsel değişimlerin transdantal teorisi, diferansiyel işlemler ve kuantum alan teorisine önemli katkıları olan ingiliz matematikçidir. 1966 da Field Medal, 2004 da Abel ödülü ile ödüllendirilmiştir.

British mathematician who made important contributions in topology, geometry, analysis, the transcenolantal theory of algebralc varieties, dlfferential, operators and quantum field theory. Awarded the Fields Madel in 1966 and the Abel Prize in 2004.

ÖZDEŞLİKLER ve ÇARPANLARA AYIRMA
IDENTITIES and FACTORING

Bu bölüm 192 alıştırma sorusu, 304 test sorusu, 16 YÖS sorusu içermektedir.

This chapter includes 192 exercise questions, 304 test questions, and 16 YÖS questions.

BÖLÜM / CHAPTER 5

ÖZDEŞLİKLER ve ÇARPANLARA AYIRMA / IDENTITIES and FACTORING

- Özdeşlikler ve Çarpanlara Ayırma / Identities and Factoring . . . . 229 - 294

BÖLÜM
05
CHAPTER

ÖZDEŞLİKLER VE ÇARPANLARA AYIRMA
IDENTITIES AND FACTORING

Alıştırmalar / Exercises

Özdeşlikler ve Çarpanlara Ayırma / Identities and Factoring

1. $m^2 - n^2 = A \cdot (m - n) \Rightarrow A = ?$

Yanıt / The Answer is m + n

2. $57^2 - 43^2 = ?$

Yanıt / The Answer is 1400

3. $89^2 - 87^2 = ?$

Yanıt / The Answer is 352

4. $25^2 - 24^2 + 71^2 - 70^2 = ?$

Yanıt / The Answer is 190

5. $67^2 - 57^2 = 10 \cdot A \Rightarrow A = ?$

Yanıt / The Answer is 124

6. $35^2 - 27^2 = 31 \cdot A \Rightarrow A = ?$

Yanıt / The Answer is 16

7. $\dfrac{95^2 - 35^2}{115^2 - 15^2} = ?$

Yanıt / The Answer is $\dfrac{3}{5}$

8. $\dfrac{123^2 - 23^2}{37^2 - 36^2} = ?$

Yanıt / The Answer is 200

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9. $x^2 - y^2 = 45, \quad x + y = 9 \quad \Rightarrow \quad x = ?$

Yanıt / The Answer is 7

10. $4x^2 - y^2 = 60, \quad 2x - y = 6 \quad \Rightarrow \quad x \cdot y = ?$

Yanıt / The Answer is 8

11. $x, y \in N,$

$x^2 - y^2 = 13 \quad \Rightarrow \quad x = ?$

Yanıt / The Answer is 7

12. $x, y \in N,$

$x^2 - y^2 = 17 \quad \Rightarrow \quad x = ?$

Yanıt / The Answer is 9

13. $\dfrac{x^2 - y^2 + x + y}{x - y + 1} = ?$

Yanıt / The Answer is x + y

14. $\dfrac{4x^2 - y^2 + 2x - y}{2x + y + 1} = ?$

Yanıt / The Answer is (2x – y)

15. $x^2 - 12x + 36 = ?$

Yanıt / The Answer is $(x - 6)^2$

16. $4x^2 - 4x + 1 = ?$

Yanıt / The Answer is $(2x - 1)^2$

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17. $x^2 + xy + \frac{y^2}{4} = ?$

Yanıt / The Answer is $\left(x + \frac{y}{2}\right)^2$

18. $x^2 + 10x - y^2 + 25 = A \cdot (x + y + 5) \Rightarrow A = ?$

Yanıt / The Answer is $x - y + 5$

19. $x^2 + y^2 + 2xy - 4 = A \cdot (x + y - 2) \Rightarrow A = ?$

Yanıt / The Answer is $x + y + 2$

20. $x = 99, \quad y = 88$

$\Rightarrow (x + y)^2 - 4xy = ?$

Yanıt / The Answer is 121

21. $x = 15, \quad y = 5$

$\Rightarrow (x - y)^2 + 4xy = ?$

Yanıt / The Answer is 400

22. $x + y = 7, \quad x \cdot y = 13 \Rightarrow x^2 + y^2 = ?$

Yanıt / The Answer is 23

23. $x - y = 4, \quad x \cdot y = 6 \Rightarrow x^2 + y^2 = ?$

Yanıt / The Answer is 28

24. $x + \frac{1}{x} = 4 \Rightarrow x^2 + \frac{1}{x^2} = ?$

Yanıt / The Answer is 14

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25. $x-\frac{1}{x}=8 \Rightarrow \mathbf{x^2+\frac{1}{x^2}=?}$

Yanıt / The Answer is 66

26. $x+\frac{1}{x}=5 \Rightarrow \left(x-\frac{1}{x}\right)^2=?$

Yanıt / The Answer is 21

27. $x-\frac{1}{x}=7 \Rightarrow \left(x+\frac{1}{x}\right)^2=?$

Yanıt / The Answer is 53

28. $2x-\frac{1}{x}=\sqrt{5} \Rightarrow \left(2x+\frac{1}{x}\right)^2=?$

Yanıt / The Answer is 13

29. $2m+\frac{1}{m}=6 \Rightarrow 4m^2+\frac{1}{m^2}=?$

Yanıt / The Answer is 32

30. $3a+\frac{1}{a}=2\sqrt{5} \Rightarrow 9a^2+\frac{1}{a^2}=?$

Yanıt / The Answer is 14

31. $x^2-3x-1=0 \Rightarrow x^2+\frac{1}{x^2}=?$

Yanıt / The Answer is 11

32. $x-y=5,\ x\cdot y=4 \Rightarrow x^3-y^3=?$

Yanıt / The Answer is 185

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33. $x + y = 6,\ x \cdot y = 3 \Rightarrow x^3 + y^3 = ?$

Yanıt / The Answer is 162

34. $x - y = 7,\ x \cdot y = 5 \Rightarrow x^3 - y^3 = ?$

Yanıt / The Answer is 448

35. $x + y = 8,\ x \cdot y = 5 \Rightarrow x^3 + y^3 = ?$

Yanıt / The Answer is 392

36. $x + \frac{1}{x} = 5 \Rightarrow x^3 + \frac{1}{x^3} = ?$

Yanıt / The Answer is 110

37. $a - \frac{1}{a} = 3 \Rightarrow a^3 - \frac{1}{a^3} = ?$

Yanıt / The Answer is 36

38. $m + \frac{2}{m} = 6 \Rightarrow m^3 + \frac{8}{m^3} = ?$

Yanıt / The Answer is 180

39. $x - \frac{3}{x} = 8 \Rightarrow x^3 - \frac{27}{x^3} = ?$

Yanıt / The Answer is 584

40. $x = \sqrt[3]{4} - 1$

$\Rightarrow x^3 + 3x^2 + 3x + 1 = ?$

Yanıt / The Answer is 4

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41. $a = \sqrt[3]{5} + 1$

$\Rightarrow$ $\mathbf{a^3 - 3a^2 + 3a - 1 = ?}$

Yanıt / The Answer is 5

42. $x = 2018,\quad y = 2013$

$\Rightarrow$ $\mathbf{x^3 - 3x^2y + 3xy^2 - y^3 = ?}$

Yanıt / The Answer is 125

43. $a = \sqrt[3]{5} + 1$

$\Rightarrow$ $\mathbf{a^3 - 3a^2 + 3a + 7 = ?}$

Yanıt / The Answer is 13

44. $m = \sqrt[3]{4} - 1$

$\Rightarrow$ $\mathbf{m^3 + 3m^2 + 3m + 15 = ?}$

Yanıt / The Answer is 18

45. $x = \sqrt[3]{3} + 2$

$\Rightarrow$ $\mathbf{x^3 - 6x^2 + 12x - 10 = ?}$

Yanıt / The Answer is 1

46. $x^3 + 3x^2y = 36,$

$y^3 + 3xy^2 = 28 \quad \Rightarrow \quad \mathbf{x + y = ?}$

Yanıt / The Answer is 4

47. $x^3 - 3x^2y = 120,$

$3xy^2 - y^3 = 5 \quad \Rightarrow \quad \mathbf{x - y = ?}$

Yanıt / The Answer is 5

48. $y^2(3x - y) = 16,$

$x^2(x - 3y) = 11 \quad \Rightarrow \quad \mathbf{x - y = ?}$

Yanıt / The Answer is 3

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49. $m^2(m + 3n) = 93,$

$n^2(3m + n) = 32 \Rightarrow$ **$m + n = ?$**

Yanıt / The Answer is 5

50. $(x + 3)^2 + (y - 5)^2 = 0 \Rightarrow$ **$x + y = ?$**

Yanıt / The Answer is 2

51. $(x + 9)^2 + y^2 - 4y + 4 = 0 \Rightarrow$ **$x \cdot y = ?$**

Yanıt / The Answer is –18

52. $x^2 - 6x + 9 + y^2 - 10y + 25 = 0 \Rightarrow$ **$x + y = ?$**

Yanıt / The Answer is 8

53. $x^2 + y^2 + 2x - 4y + 5 = 0 \Rightarrow$ **$2x - 4y = ?$**

Yanıt / The Answer is –10

54. $A = x^2 - 10x + 27 \Rightarrow$ **min(A) = ?**

Yanıt / The Answer is 2

55. $A = a^2 + 8a + 13 \Rightarrow$ **min(A) = ?**

Yanıt / The Answer is –3

56. $A = x^2 + y^2 + 6x - 4y + 17 \Rightarrow$ **min(A) = ?**

Yanıt / The Answer is 4

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57. $6x - 3y = A \cdot (2x - y) \Rightarrow$ **A = ?**

Yanıt / The Answer is 3

58. $4x^2 - 8x = A \cdot (x - 2) \Rightarrow$ **A = ?**

Yanıt / The Answer is 4x

59. $5xy^2 - 10x^2y = A \cdot (y - 2x) \Rightarrow$ **A = ?**

Yanıt / The Answer is 5xy

60. $3x(a + b) - y\,(a + b) = A \cdot (a + b) \Rightarrow$ **A = ?**

Yanıt / The Answer is 3x – y

61. $x^2(a - b) - y(b - a) = A \cdot (a - b) \Rightarrow$ **A = ?**

Yanıt / The Answer is $x^2 + y$

62. $(a - b)^2 - 5(b - a) = A \cdot (a - b) \Rightarrow$ **A = ?**

Yanıt / The Answer is a – b + 5

63. $ax - ay + bx - by = A(x - y) \Rightarrow$ **A = ?**

Yanıt / The Answer is a + b

64. $x^3 - x^2 - x + 1 = A \cdot (x^2 - 1) \Rightarrow$ **A = ?**

Yanıt / The Answer is x – 1

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65. $x = 3, \quad y = 5$

$\Rightarrow$ **$xy^2 - x^2y + 6y - 6x = ?$**

Yanıt / The Answer is 42

66. $x = 5, \quad y = 7$

$\Rightarrow$ **$x^2y - 3x + xy^2 - 3y = ?$**

Yanıt / The Answer is 384

67. $x - y = 6, \quad y - z = 4$

$\Rightarrow$ **$yz - y^2 + xy - xz = ?$**

Yanıt / The Answer is 24

68. $x^2 - 4x - 5 = A\cdot(x - 5) \quad \Rightarrow \quad$ **A = ?**

Yanıt / The Answer is x + 1

69. $x^2 - x - 6 = A\cdot(x + 2) \quad \Rightarrow \quad$ **A = ?**

Yanıt / The Answer is x – 3

70. $x^2 - 2x - 15 = A\cdot(x + 3) \quad \Rightarrow \quad$ **A = ?**

Yanıt / The Answer is x – 5

71. $x^2 + 8mx + 15m^2 = A\cdot(x + 5m) \quad \Rightarrow \quad$ **A = ?**

Yanıt / The Answer is x + 3m

72. $x^2 + 2ax - 24a^2 = A\cdot(x + 6a) \quad \Rightarrow \quad$ **A = ?**

Yanıt / The Answer is x – 4a

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73. $2x^2 - 9x + 4 = A \cdot (2x - 1) \Rightarrow A = ?$

Yanıt / The Answer is $x - 4$

74. $6x^2 + x - 2 = A \cdot (3x + 2) \Rightarrow A = ?$

Yanıt / The Answer is $2x - 1$

75. $2x^2 - 3x - 2 = A \cdot (2x + 1) \Rightarrow A = ?$

Yanıt / The Answer is $x - 2$

76. $3x^2 + 4x - 15 = A \cdot (3x - 5) \Rightarrow A = ?$

Yanıt / The Answer is $x + 3$

77. $\dfrac{8x - 8y}{2x - 2y} = ?$

Yanıt / The Answer is 4

78. $\dfrac{3x^3y^2 - 9xy}{2x^2y - 6} = ?$

Yanıt / The Answer is $\dfrac{3xy}{2}$

79. $\dfrac{2^{x+2} + 2^{x+1}}{2^x + 2^{x+1}} = ?$

Yanıt / The Answer is 2

80. $\dfrac{3^{x+2} - 3^x}{3^{x+1} - 3^x} = ?$

Yanıt / The Answer is 4

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81. $\dfrac{2mx+nx-2my-ny}{2mx+nx+2my+ny}=?$

Yanıt / The Answer is $\dfrac{x-y}{x+y}$

82. $\dfrac{xy-2y^2-4x+8y}{x^2-2xy-x+2y}=?$

Yanıt / The Answer is $\dfrac{y-4}{x-1}$

83. $\dfrac{x^2-12x+35}{x^2-3x-10}=?$

Yanıt / The Answer is $\dfrac{x-7}{x+2}$

84. $\dfrac{x^2-7x+6}{x^2-3x-18}=?$

Yanıt / The Answer is $\dfrac{x-1}{x+3}$

85. $\dfrac{5x^2+13x-6}{x^2-x-12}=?$

Yanıt / The Answer is $\dfrac{5x-2}{x-4}$

86. $\dfrac{2x^2-4x-16}{x^2+5x+6}=?$

Yanıt / The Answer is $\dfrac{2x-8}{x+3}$

87. $a-b=2$,

$b-c=2 \Rightarrow a^2+c^2-2b^2=?$

Yanıt / The Answer is 8

88. $a-c=6$,

$b+c=4 \Rightarrow a\cdot b-b\cdot c+a\cdot c-c^2=?$

Yanıt / The Answer is 24

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89. $\frac{x-4}{4-x} = ?$

Yanıt / The Answer is –1

90. $\frac{x^2-4}{x-2} = ?$

Yanıt / The Answer is x + 2

91. $\frac{x^2-4x+4}{x-2} = ?$

Yanıt / The Answer is x – 2

92. $\frac{x^2-1}{x+1} : \frac{x^2-2x+1}{x-1} = ?$

Yanıt / The Answer is 1

93. $\frac{57^2-55^2}{112} = ?$

Yanıt / The Answer is 2

94. $\frac{(3-x)\cdot(x+3)}{(x-3)\cdot(-x-3)} = ?$

Yanıt / The Answer is 1

95. $\frac{a^3-7\cdot a^2}{7-a} = ?$

Yanıt / The Answer is $-a^2$

96. $\frac{5a^2+15a}{5a} = ?$

Yanıt / The Answer is a + 3

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97. $\frac{2a^2+10a}{2a+10}=?$

Yanıt / The Answer is a

98. $\frac{a^3-16a}{4-a}:(a+4)=?$

Yanıt / The Answer is –a

99. $\frac{x^2-2x-3}{x^2+x-12}=?$

Yanıt / The Answer is $\frac{x+1}{x+4}$

100. $\frac{x^2+3x-10}{x^2+4x-5}=?$

Yanıt / The Answer is $\frac{x-2}{x-1}$

101. $\frac{99^2-55^2}{11\cdot 154}=?$

Yanıt / The Answer is 4

102. $\frac{a+b}{a^{-1}+b^{-1}}=?$

Yanıt / The Answer is a·b

103. $\frac{3x^2+15x}{5+x}=?$

Yanıt / The Answer is 3x

104. $\frac{4x^2-20x}{5-x}=?$

Yanıt / The Answer is –4x

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105. $\dfrac{3x^2y-3y^2x}{x^2-2xy+y^2}=?$

Yanıt / The Answer is $\dfrac{3xy}{x-y}$

106. $\dfrac{1}{x^2+x}+\dfrac{1}{x+1}=?$

Yanıt / The Answer is $\dfrac{1}{x}$

107. $\dfrac{x^2-25}{x-5}=?$

Yanıt / The Answer is $x + 5$

108. $\dfrac{x^2+7x+12}{x+4}=?$

Yanıt / The Answer is $x + 3$

109. $\dfrac{x^3-2x^2+x}{x^2-x}=?$

Yanıt / The Answer is $x - 1$

110. $\dfrac{x^3y^2+x^2y^3-x^2y^2}{x+y-1}=?$

Yanıt / The Answer is x^2y^2

111. $\dfrac{(x-y)^2+4xy}{x^2-y^2}=?$

Yanıt / The Answer is $\dfrac{x+y}{x-y}$

112. $\dfrac{abx^2+ax+bx+1}{bx+1}=?$

Yanıt / The Answer is $ax + 1$

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113. $\dfrac{xy - ay + 3ab - 3xb}{3b - y} = ?$

Yanıt / The Answer is $a - x$

114. $\dfrac{x^2 - 3ay - 3ax - y^2}{x - y - 3a} = ?$

Yanıt / The Answer is $x + y$

115. $\dfrac{5x^2 + 5ax + ab + xb}{5x + b} = ?$

Yanıt / The Answer is $a + x$

116. $\dfrac{(x + y)^2 - x - y}{x + y - 1} = ?$

Yanıt / The Answer is $x + y$

117. $\left(\dfrac{a}{b} - \dfrac{b}{a}\right) : \left(\dfrac{5}{a} - \dfrac{5}{b}\right) = ?$

Yanıt / The Answer is $-\dfrac{a + b}{5}$

118. $\dfrac{\dfrac{1}{a} + a}{1 + \dfrac{1}{a^2}} = ?$

Yanıt / The Answer is a

119. $\dfrac{2a^2 + 4a}{a^2 + 3a} \cdot \dfrac{a^2 + 7a + 12}{a^2 + 4a} = ?$

Yanıt / The Answer is $\dfrac{2a + 4}{a}$

120. $\dfrac{x^2 - 2x}{x^2 - 5x + 6} : \dfrac{x^2 + x}{x^2 - 2x - 3} = ?$

Yanıt / The Answer is 1

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121. $\frac{x+6}{6-x} : \left(1+\frac{12}{x-6}\right) = ?$

Yanıt / The Answer is –1

122. $\dfrac{\frac{x}{y}-\frac{y}{x}}{\frac{1}{x}-\frac{1}{y}} = ?$

Yanıt / The Answer is – (x + y)

123. $\frac{(x+2)^2-y^2}{x^2-(y+2)^2} = ?$

Yanıt / The Answer is $\frac{x-y+2}{x-y-2}$

124. $\frac{x^2-3x-10}{x^2+5x+6} \cdot \frac{2x^3+6x^2}{x^2-5x} = ?$

Yanıt / The Answer is 2x

125. $1-\frac{5-2(3x-2)}{1+2(x-2)} = ?$

Yanıt / The Answer is 4

126. $\dfrac{x+\frac{2x}{x-2}}{1+\frac{4}{x^2-4}} = ?$

Yanıt / The Answer is x + 2

127. $\frac{a^2b-ab^2}{3a+3} : \frac{a^2-ab}{6a+6} = ?$

Yanıt / The Answer is 2b

128. $\frac{a^2}{a-3}+\frac{2a+3}{3-a} = ?$

Yanıt / The Answer is a + 1

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129. $\dfrac{a^2-b^2}{a^{-1}+b^{-1}} \cdot \dfrac{1}{a-b} = ?$

Yanıt / The Answer is a·b

130. $\dfrac{x+2}{1-\dfrac{4}{x^2}} : x^2 = ?$

Yanıt / The Answer is $\dfrac{1}{x-2}$

131. $\dfrac{x^2-2x+1-y^2}{x-y-1} = ?$

Yanıt / The Answer is x + y − 1

132. $\dfrac{x^2-y^2}{x^2+xy} : \dfrac{x^2-xy}{x^3} = ?$

Yanıt / The Answer is x

133. $\dfrac{x^2+x-2}{\left(\dfrac{x}{x-1}\right)^{-1}} = ?$

Yanıt / The Answer is x·(x + 2)

134. $\dfrac{x^2+4x-5}{x^2-1} : \dfrac{x^2-25}{x+1} = ?$

Yanıt / The Answer is $\dfrac{1}{x-5}$

135. $\dfrac{1-\dfrac{1}{x}}{1-\dfrac{1}{x^2}} + \dfrac{1}{x+1} = ?$

Yanıt / The Answer is 1

136. $\dfrac{1-\dfrac{1}{x}}{\dfrac{1}{x}} : \dfrac{x-\dfrac{1}{x}}{\dfrac{x^2-1}{x}} = ?$

Yanıt / The Answer is x − 1

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137. $\dfrac{4x^2-9}{3x} : \dfrac{2x+3}{9} = ?$

Yanıt / The Answer is $\dfrac{6x-9}{x}$

138. $\dfrac{a^2-b^2}{a+b} : \dfrac{a-b}{a} = ?$

Yanıt / The Answer is a

139. $\dfrac{(x+a)^2-a^2}{x+2a} : x = ?$

Yanıt / The Answer is 1

140. $\dfrac{\frac{2}{x}-2}{\frac{2x-2}{x}} = ?$

Yanıt / The Answer is –1

141. $\dfrac{x^2-y^2+ax+ay}{x-y+a} = ?$

Yanıt / The Answer is x + y

142. $\left(\dfrac{9}{x^2}-1\right) : \left(1-\dfrac{3}{x}\right) = ?$

Yanıt / The Answer is $-\dfrac{x+3}{x}$

143. $\dfrac{3x^2-6x+3}{x+1} : \dfrac{x^2-x}{x^2+x} = ?$

Yanıt / The Answer is 3x – 3

144. $\dfrac{x^2-6x+9}{x^2-9} + \dfrac{3}{x+3} = ?$

Yanıt / The Answer is $\dfrac{x}{x+3}$

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145. $\dfrac{x^3-y^3}{x^2+xy+y^2} : \dfrac{x^2-y^2}{x+y} = ?$

Yanıt / The Answer is 1

146. $\dfrac{x^3+y^3}{x^2-y^2} : \dfrac{x^2-xy+y^2}{x-y} = ?$

Yanıt / The Answer is 1

147. $\dfrac{x^3+y^3}{x^2-y^2} - \dfrac{xy}{x-y} = ?$

Yanıt / The Answer is $x-y$

148. $\dfrac{x^2-4}{x^3-8} : \dfrac{1}{x^2+2x+4} = ?$

Yanıt / The Answer is $x+2$

149. $\dfrac{x^3+y^3}{x+y} - \dfrac{x^3-y^3}{x-y} = ?$

Yanıt / The Answer is $-2xy$

150. $\dfrac{x^3-y^3}{x^2-y^2} + \dfrac{-xy}{x+y} = ?$

Yanıt / The Answer is $\dfrac{x^2+y^2}{x+y}$

151. $\dfrac{x^3-y^3}{(x-y)^2+3xy} = ?$

Yanıt / The Answer is $x-y$

152. $\dfrac{a^2-b^2}{a^3-b^3} : \dfrac{3a+3b}{a^2+ab+b^2} = ?$

Yanıt / The Answer is $\dfrac{1}{3}$

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153. $\dfrac{a^3-1}{(a^2+a+1)} : \dfrac{a-1}{a^3} = ?$

Yanıt / The Answer is a^3

154. $a^x = 3 \Rightarrow \dfrac{a^{2x}+2a^x-15}{a^{2x}-9} = ?$

Yanıt / The Answer is $\frac{4}{3}$

155. $x^a = 13 \Rightarrow \dfrac{x^{3a}+27}{x^{2a}-3x^a+9} = ?$

Yanıt / The Answer is 16

156. $\dfrac{a^2-4}{a-2} - \dfrac{a^3-8}{a^2+2a+4} = ?$

Yanıt / The Answer is 4

157. $\dfrac{9^x-4^x}{3^x+2^x} + 2^x = ?$

Yanıt / The Answer is 3^x

158. $\dfrac{9^x-16^x}{3^x+4^x} = 27 - 4^x \Rightarrow x = ?$

Yanıt / The Answer is 3

159. $\dfrac{8^x-1}{4^x-1} : \dfrac{4^x+2^x+1}{2^x+1} = ?$

Yanıt / The Answer is 1

160. $\left(x-\frac{3}{y}\right) : \left(y-\frac{3}{x}\right) = ?$

Yanıt / The Answer is $\frac{x}{y}$

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161. $\frac{a}{a+1}+\frac{1}{a-1}-\frac{2}{a^2-1}=?$

Yanıt / The Answer is 1

165. $\frac{300^2-30^2}{30^2-3^2}=50x \Rightarrow x=?$

Yanıt / The Answer is 2

162. $\frac{3}{x+2}:\left(\frac{3}{x^2+x-2}-\frac{1}{x-1}\right)=?$

Yanıt / The Answer is –3

166. $\frac{4x+4y}{x^2+2xy+y^2}:\frac{2x-2y}{x^2-y^2}=?$

Yanıt / The Answer is 2

163. $\frac{x-\frac{x}{y}}{y-1}=4 \Rightarrow \frac{(x+3y)^2}{x^2-9y^2}=?$

Yanıt / The Answer is 7

167. $\frac{1}{x-\frac{y^2}{x}}-\frac{1}{\frac{x^2}{y}-y}=?$

Yanıt / The Answer is $\frac{1}{x+y}$

164. $\frac{x^2-1}{x^2-x}:\frac{x^3-2x^2+x}{(x^2-x)^2}=?$

Yanıt / The Answer is x + 1

168. $\frac{ax^3-ax^2}{x^2-1}:\frac{ax+a}{x^2+2x+1}=?$

Yanıt / The Answer is x^2

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169. $\left(\frac{a}{a+b}-\frac{b}{b-a}\right):\left(\frac{a^2+b^2}{a+b}\right)=?$

Yanıt / The Answer is $\frac{1}{a-b}$

170. $\frac{a^3-1}{a^2-1}:\frac{a^3+a^2+a}{a^2+3a+2}=?$

Yanıt / The Answer is $\frac{a+2}{a}$

171. $\frac{x^2-2x-3}{x^2-1}:\frac{x^2+7x+12}{x^2+3x-4}=?$

Yanıt / The Answer is $\frac{x-3}{x+3}$

172. $\frac{x^2+y^2}{x\cdot y}+\frac{y^2-xy}{x^2-yx}=?$

Yanıt / The Answer is $\frac{x}{y}$

173. $\dfrac{\frac{m^3+m^2n}{m+n}-\frac{x^3+x^2y}{x+y}}{x+m}=?$

Yanıt / The Answer is m – x

174. $\dfrac{m-\frac{1}{n}}{n-\frac{1}{m}}+\frac{m^2-mn}{n^2-mn}=?$

Yanıt / The Answer is 0

175. $\frac{m^2+2mn+n^2}{(m-n)^2}\cdot\left(\frac{n-m}{m+n}\right)^2=?$

Yanıt / The Answer is 1

176. $\frac{3}{m+2}:\left(\frac{3}{m^2+m-2}-\frac{1}{m-1}\right)=?$

Yanıt / The Answer is –3

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177. $\dfrac{m-\dfrac{1}{m}}{1-\dfrac{1}{m}} \cdot \dfrac{m^2}{m^3+m^2} = ?$

Yanıt / The Answer is 1

178. $\dfrac{(m-n)^2+4mn}{m+n} : \dfrac{m^2-n^2}{m-n} = ?$

Yanıt / The Answer is 1

179. $\left(\dfrac{a^2+1}{2a}-1\right) : \dfrac{a^2-a}{a^2} = ?$

Yanıt / The Answer is $\dfrac{a-1}{2}$

180. $\dfrac{2a}{a^2-1} + \dfrac{1}{1-a} = ?$

Yanıt / The Answer is $\dfrac{1}{a+1}$

181. $\dfrac{x^2-5x+4}{x-1} + \dfrac{x^2+x}{x+1} = ?$

Yanıt / The Answer is $2x-4$

182. $\dfrac{16^x-1}{64^x+1} \cdot \dfrac{16^x-4^x+1}{4^x-1} = ?$

Yanıt / The Answer is 1

183. $\dfrac{27^x+1}{3^x+1} : \dfrac{9^x-3^x+1}{3^x} = ?$

Yanıt / The Answer is 3^x

184. $\dfrac{a^3+b^3}{a^2-b^2} : \dfrac{a^2-ab+b^2}{a-b} = ?$

Yanıt / The Answer is 1

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185. $\dfrac{a^3-b^3}{a^2+ab+b^2}\cdot\dfrac{5a+5b}{a^2-b^2}=?$

Yanıt / The Answer is 5

186. $\dfrac{2^x-1}{8^x-1}:\dfrac{4^{-1}}{4^x+2^x+1}=?$

Yanıt / The Answer is 4

187. $\dfrac{x^3-y^3}{y^2-2xy+x^2}:\dfrac{x^2+xy+y^2}{x^2-y^2-x+y}=?$

Yanıt / The Answer is x + y – 1

188. $\dfrac{a^3-b^3}{a^2b^2-ab^3}:\dfrac{a^3+a^2b+ab^2}{2a^2b^2}=?$

Yanıt / The Answer is 2

189. $\dfrac{x^3-3x^2+x-3}{x^3-x^2+x-1}:\dfrac{x-3}{x-1}=?$

Yanıt / The Answer is 1

190. $\dfrac{x^3+8}{x^2-4}:\dfrac{x^2-2x+4}{x^2-2x}=?$

Yanıt / The Answer is x

191. $\dfrac{3^{2x}-2\cdot3^{x+y}+3^{2y}}{3^{2x}-3^{x+y}}=?$

Yanıt / The Answer is $\dfrac{3^x-3^y}{3^x}$

192. $\dfrac{a^{x+2}-a^{x+1}-2a^x}{a^{x+1}+a^x}=?$

Yanıt / The Answer is a – 2

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1. $\left.\begin{array}{l} x^2 - y^2 = 48 \\ x - y = 4 \end{array}\right\} \Rightarrow$ **$x + y = ?$**

A) 6 B) 8 C) 10 D) 12 E) 14

2. $\left.\begin{array}{l} x^2 - y^2 = 144 \\ x + y = 16 \end{array}\right\} \Rightarrow$ **$x - y = ?$**

A) 10 B) 9 C) 8 D) 7 E) 6

3. $\left.\begin{array}{l} x^2 - y^2 = 200 \\ x - y = 10 \end{array}\right\} \Rightarrow$ **$x \cdot y = ?$**

A) 75 B) 70 C) 65 D) 60 E) 55

4. $\left.\begin{array}{l} x^2 - y^2 = 225 \\ x + y = 25 \end{array}\right\} \Rightarrow$ **$x \cdot y = ?$**

A) 120 B) 124 C) 128 D) 132 E) 136

5. $x, y \ N^+$

$x^2 - y^2 = 31 \Rightarrow$ **$x \cdot y = ?$**

A) 200 B) 205 C) 240 D) 215 E) 220

6. $a^2 + ab = 15$

$b^2 + ab = 10$

$\Rightarrow$ **$|a + b| = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

7. **$a \cdot (a + b) + b \cdot (a + b) = 64$**

$\Rightarrow$ **$(a + b)^2 = ?$**

A) 4 B) 8 C) 16 D) 36 E) 64

8. $a^2 - ab = 74$

$b^2 - ab = 26$

$\Rightarrow$ **$(a - b)^2 = ?$**

A) 10 B) 20 C) 25 D) 50 E) 100

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9. $\left.\begin{array}{l} x^2 - xy = 48 \\ xy - y^2 = -16 \end{array}\right\} \Rightarrow$ $\mathbf{(x-y)^2 = ?}$

A) 100 B) 81 C) 64 D) 49 E) 36

10. $a(a + b) + b(a + b) = 16$

$\Rightarrow$ $\mathbf{|a + b| = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

11. $\left.\begin{array}{l} a \cdot b = 7 \\ a + b = 4 \end{array}\right\} \Rightarrow$ $\mathbf{a^2 + b^2 = ?}$

A) 2 B) 4 C) 6 D) 8 E) 12

12. $\left.\begin{array}{l} a + b = 12 \\ a \cdot b = 20 \end{array}\right\} \Rightarrow$ $\mathbf{a^2 + b^2 = ?}$

A) 90 B) 95 C) 97 D) 104 E) 144

13. $\left.\begin{array}{l} a - b = 4 \\ a \cdot b = 7 \end{array}\right\} \Rightarrow$ $\mathbf{a^2 + b^2 = ?}$

A) 10 B) 20 C) 30 D) 40 E) 50

14. $\left.\begin{array}{l} a - b = 6 \\ a \cdot b = 10 \end{array}\right\} \Rightarrow$ $\mathbf{a^2 + b^2 = ?}$

A) 16 B) 26 C) 36 D) 46 E) 56

15. $x + \frac{2}{x} = 5 \Rightarrow$ $\mathbf{x^2 + \frac{4}{x^2} = ?}$

A) 15 B) 21 C) 25 D) 28 E) 35

16. $x - \frac{1}{x} = 4 \Rightarrow$ $\mathbf{x^2 + \frac{1}{x^2} = ?}$

A) 12 B) 16 C) 18 D) 24 E) 28

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	B	A	E	C	E	E	E
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	D	A	D	C	E	B	C

1. $x, y \in Z^+$,

$x^2 - y^2 = 11 \Rightarrow$ **x = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

2. $\left.\begin{array}{l} 4^{2a} - 4^{2b} = 16 \\ 4^a + 4^b = 8 \end{array}\right\} \Rightarrow \mathbf{4^a - 4^b = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

3. $x, y \in R^+$

$4x^2 - 9y^2 = 13 \Rightarrow$ **x = ?**

A) $\frac{7}{2}$ B) $\frac{7}{3}$ C) $\frac{7}{4}$ D) $\frac{7}{5}$ E) $\frac{7}{6}$

4. $\left.\begin{array}{l} a + b = 6 \\ a \cdot b = 12 \end{array}\right\} \Rightarrow \mathbf{a^2 + b^2 = ?}$

A) 3 B) 6 C) 9 D) 12 E) 18

5. $\left.\begin{array}{l} a - b = 7 \\ a \cdot b = 60 \end{array}\right\} \Rightarrow \mathbf{a^2 + b^2 = ?}$

A) 132 B) 144 C) 156 D) 169 E) 172

6. $\left.\begin{array}{l} x^2 + y^2 = 20 \\ x \cdot y = 8 \end{array}\right\} \Rightarrow \mathbf{x^4 + y^4 = ?}$

A) 180 B) 172 C) 210 D) 240 E) 272

7. $\left.\begin{array}{l} x^2 + y^2 = 13 \\ x \cdot y = 4 \end{array}\right\} \Rightarrow \mathbf{x^4 + y^4 = ?}$

A) 130 B) 132 C) 134 D) 137 E) 139

8. $\left.\begin{array}{l} x + y = 5 \\ x \cdot y = 2 \end{array}\right\} \Rightarrow \mathbf{x^4 + y^4 = ?}$

A) 407 B) 410 C) 417 D) 425 E) 433

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9. $\left.\begin{array}{l} x^5+y^5=14 \\ x\cdot y=2 \end{array}\right\} \Rightarrow \mathbf{x^{10}+y^{10}=?}$

A) 130 B) 131 C) 132 D) 133 E) 134

10. $x-\frac{1}{x}=4 \Rightarrow \mathbf{x^2+\frac{1}{x^2}=?}$

A) 4 B) 8 C) 12 D) 14 E) 18

11. $x+\frac{1}{x}=4 \Rightarrow \mathbf{\frac{x^4+1}{x^2}=?}$

A) 10 B) 12 C) 14 D) 16 E) 18

12. $x+\frac{1}{x}=8 \Rightarrow \mathbf{\frac{x^4+1}{x^2}=?}$

A) 60 B) 61 C) 62 D) 63 E) 64

13. $2x-\frac{1}{x}=6$

$\Rightarrow \mathbf{4x^2+\frac{1}{x^2}=?}$

A) 40 B) 42 C) 44 D) 46 E) 48

14. $a+\frac{1}{a}=5 \Rightarrow \mathbf{\frac{a^6+a^2}{a^4}=?}$

A) 23 B) 25 C) 33 D) 35 E) 43

15. $a^2-5a+1=0 \Rightarrow \mathbf{a^2+\frac{1}{a^2}=?}$

A) 13 B) 15 C) 17 D) 19 E) 23

16. $x^2-4x+2=0 \Rightarrow \mathbf{x^2+\frac{4}{x^2}=?}$

A) 10 B) 12 C) 14 D) 16 E) 18

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	B	A	D	D	E	D	E
9	10	11	12	13	14	15	16
C	E	C	C	A	A	E	B

1. $x^2 - y = y^2 - x \Rightarrow \mathbf{x + y = ?}$

A) –2 B) –1 C) 0 D) 1 E) 2

2. $\left.\begin{array}{l} a+b=12 \\ a^2+b^2=84 \end{array}\right\} \Rightarrow \mathbf{a \cdot b = ?}$

A) 12 B) 15 C) 20 D) 25 E) 30

3. $(3x+1)^2 = 9x^2 + 97 \Rightarrow \mathbf{x = ?}$

A) 16 B) 18 C) 24 D) 28 E) 32

4. $(a+b)^2 = 4ab \Rightarrow \mathbf{a - b + 3 = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

5. $\left.\begin{array}{l} a^2+b^2+a\cdot b=60 \\ a-b=6 \end{array}\right\} \Rightarrow \mathbf{a \cdot b = ?}$

A) 5 B) 6 C) 8 D) 10 E) 12

6. $\left.\begin{array}{l} \dfrac{x^2-y^2}{x^2y-xy^2}=4 \\ x\cdot y=3 \end{array}\right\} \Rightarrow \mathbf{x^2 + y^2 = ?}$

A) 108 B) 116 C) 124 D) 138 E) 140

7. $x, y \in Z^+$

$4x^2 - y^2 = 23 \Rightarrow \mathbf{x + y = ?}$

A) 15 B) 16 C) 17 D) 18 E) 19

8. $a \neq 0$,

$\left.\begin{array}{l} 1-\dfrac{b}{a}=\dfrac{3}{a} \\ a\cdot b=10 \end{array}\right\} \Rightarrow \mathbf{a^2 + b^2 = ?}$

A) 27 B) 29 C) 31 D) 33 E) 35

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9. $\frac{a}{b}+\frac{4b}{a}=4 \Rightarrow \frac{a+b}{a-b}=?$

A) 1 B) 3 C) 5 D) 7 E) 9

10. $\left.\begin{array}{l} a^2-b^2=25 \\ \frac{1}{a-b}+\frac{1}{a+b}=\frac{26}{25} \end{array}\right\} \Rightarrow a-b=?$

A) 1 B) 2 C) 4 D) 5 E) 7

11. $\left.\begin{array}{l} b-a^2=x \\ b^2+a=y \\ a-b=1 \end{array}\right\} \Rightarrow x+y=?$

A) 0 B) 1 C) 2 D) 3 E) 4

12. $\frac{a}{b}+\frac{b}{a}=8 \Rightarrow \frac{(a-b)^2}{a\cdot b}=?$

A) 4 B) 6 C) 8 D) 10 E) 12

13. $\left.\begin{array}{l} a+b=7 \\ a\cdot b=8 \end{array}\right\} \Rightarrow \frac{a^2}{a-1}+\frac{b^2}{b-1}=?$

A) $\frac{15}{2}$ B) $\frac{17}{2}$ C) $\frac{21}{2}$ D) $\frac{23}{2}$ E) $\frac{25}{2}$

14. $\left.\begin{array}{l} a^2-c^2=55 \\ c^2-b^2=13 \\ a-b=4 \end{array}\right\} \Rightarrow a+b=?$

A) 11 B) 14 C) 15 D) 16 E) 17

15. $\left.\begin{array}{l} a-c=c-b=5 \\ a\cdot b=24 \end{array}\right\} \Rightarrow a^2+b^2=?$

A) 132 B) 144 C) 148 D) 152 E) 160

16. $a>b$,

$\left.\begin{array}{l} a^2-ab=75 \\ ab-b^2=50 \end{array}\right\} \Rightarrow a+b=?$

A) 15 B) 25 C) 30 D) 35 E) 40

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	E	A	C	C	D	C	B
9	10	11	12	13	14	15	16
B	A	A	B	D	E	C	B

1. $\dfrac{200^2-20^2}{50^2-5^2}=8\cdot x \Rightarrow$ **x = ?**

A) 2 B) 4 C) 6 D) 8 E) 10

2. $\dfrac{(200^2-25^2)-625}{62}=x^4 \Rightarrow$ **x = ?**

A) 5 B) 10 C) 15 D) 20 E) 25

3. $\dfrac{(325^2-25^2)-300\cdot 50}{6a}=600 \Rightarrow$ **a = ?**

A) 15 B) 25 C) 30 D) 50 E) 75

4. $\left.\begin{array}{l}a=17,49\\ b=12,51\end{array}\right\} \Rightarrow$ $\mathbf{(a-b)^2+4ab=?}$

A) 30 B) 300 C) 450 D) 600 E) 900

5. $a-b=b-c=2$

$\Rightarrow \mathbf{a^2-2b^2+c^2+1=?}$

A) 7 B) 8 C) 9 D) 10 E) 11

6. $\dfrac{x^2-bx-12}{x^2+10x+c}=\dfrac{x-2}{x+4} \Rightarrow$ **b + c = ?**

A) 10 B) 14 C) 16 D) 20 E) 24

7. $37\cdot 53=a^2-b^2$

$\Rightarrow$ **b = ?**

A) 6 B) 8 C) 10 D) 12 E) 16

8. **(10002)·(9998) = ?**

A) 10^4-2 B) 10^6-4 C) 10^6-2 D) 10^8-2 E) 10^8-4

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9. $\dfrac{52^2 - 48 \cdot 104 + 48^2}{52^2 - 48^2} = ?$

A) 0,004 B) 0,04 C) 0,4 D) 4 E) 40

10. x = 2, 998,

y = 0, 998

$\Rightarrow$ **$x^3 - 3x^2y + 3xy^2 - y^3 = ?$**

A) 2 B) 4 C) 6 D) 8 E) 12

11. $\dfrac{\dfrac{100}{99} + 1}{\left(\dfrac{100}{99}\right)^2 - 1} = ?$

A) 99 B) 100 C) 101 D) 121 E) 144

12. $x = \dfrac{2}{5}$, $y = \dfrac{3}{5}$

$\Rightarrow \dfrac{(x - y)^2 + 4xy}{x^3 + y^3} = ?$

A) $\frac{7}{25}$ B) $\frac{7}{15}$ C) $\frac{15}{7}$ D) $\frac{25}{7}$ E) $\frac{30}{7}$

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13. a = 100002

$\Rightarrow$ **$a^2 - 4a = ?$**

A) $10^6 - 4$ B) $10^8 - 4$ C) $10^{10} - 4$ D) $10^8 - 2$ E) $10^{10} - 2$

14. $3(a - 2)^2 + 5(b + 1)^2 = 0$

$\Rightarrow$ **5b + 3a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

15. $a, b, c \in R^+$,

$\left.\begin{array}{l} \dfrac{a}{b} = \dfrac{b}{c} \\ a^2 + 9ac + 6ab = 36 \end{array}\right\} \Rightarrow a + 3b = ?$

A) 3 B) 6 C) 12 D) 18 E) 27

16. a + b = 8

$\Rightarrow$ **$4a^2 + 4b^2 + a^2b + ab^2 = ?$**

A) 16 B) 64 C) 128 D) 256 E) 512

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	A	B	E	C	D	B	E
9	10	11	12	13	14	15	16
B	D	A	D	C	A	B	D

1. $x^2 - a^2 = 14,$

$a^2 - y^2 = 6,$

$x + y = 5 \Rightarrow$ **y = ?**

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 2 E) 3

2. $\left.\begin{array}{l} a - 2b = 10 \\ a \cdot b = 48 \end{array}\right\} \Rightarrow \mathbf{a^2 + 4b^4 = ?}$

A) 286 B) 288 C) 290 D) 292 E) 296

3. $\left.\begin{array}{l} a - 3b = 8 \\ a \cdot b = 6 \end{array}\right\} \Rightarrow \mathbf{a^2 + 9b^2 = ?}$

A) 48 B) 56 C) 64 D) 72 E) 100

4. $\left.\begin{array}{l} 3a - 2b = 8 \\ a \cdot b = 5 \end{array}\right\} \Rightarrow \mathbf{9a^2 + 4b^2 = ?}$

A) 120 B) 124 C) 126 D) 128 E) 130

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5. $\left.\begin{array}{l} a - b = 8 \\ a \cdot b = 9 \end{array}\right\} \Rightarrow \mathbf{|a + b| = ?}$

A) 6 B) 8 C) 10 D) 12 E) 18

6. $\left.\begin{array}{l} a - b = 15 \\ a \cdot b = 12 \end{array}\right\} \Rightarrow \mathbf{|a + b| = ?}$

A) $\sqrt{273}$ B) $9\sqrt{3}$ C) $\sqrt{91}$ D) $2\sqrt{91}$ E) $3\sqrt{91}$

7. $x > y$

$\left.\begin{array}{l} x + y = 6 \\ x \cdot y = 4 \end{array}\right\} \Rightarrow \mathbf{|x - y| = ?}$

A) 2 B) $2\sqrt{3}$ C) 4 D) $2\sqrt{5}$ E) 5

8. $\left.\begin{array}{l} a + b = 12 \\ a \cdot b = 11 \end{array}\right\} \Rightarrow \mathbf{|a - b| = ?}$

A) 10 B) 11 C) 12 D) 13 E) 14

9. $\left.\begin{matrix} x-y=6 \\ x\cdot y=7 \end{matrix}\right\} \Rightarrow \mathbf{x^2-y^2=?}$

A) 6 B) 12 C) 24 D) 42 E) 48

10. $x^2+y^2+z^2=65$

$2xy+2yz+2xz=35$

$\Rightarrow \mathbf{x+y+z=?}$

A) 6 B) 7 C) 8 D) 9 E) 10

11. $\left.\begin{matrix} a-2b+c=16 \\ a^2+4b^2+c^2=180 \end{matrix}\right\} \Rightarrow \mathbf{ac-2ab-2bc=?}$

A) 38 B) 36 C) 24 D) 12 E) 8

12. $\left.\begin{matrix} x^2y-y^2x=-11 \\ x^3-y^3=60 \end{matrix}\right\} \Rightarrow \mathbf{x-y=?}$

A) 2 B) 3 C) 4 D) 5 E) 6

13. $\left.\begin{matrix} a^2(a+3b)=48 \\ b^2(b+3a)=16 \end{matrix}\right\} \Rightarrow \mathbf{a+b=?}$

A) 4 B) 5 C) 6 D) 7 E) 8

14. $\left.\begin{matrix} x=4,691 \\ y=1,309 \end{matrix}\right\} \Rightarrow \mathbf{x^3+3x^2y+3xy^2+y^3=?}$

A) 6 B) 36 C) 72 D) 144 E) 216

15. $\left.\begin{matrix} x=\sqrt[3]{5}+4 \\ y=4 \end{matrix}\right\} \Rightarrow \mathbf{x^3-3x^2y+3xy^2-y^3=?}$

A) 1 B) 2 C) 3 D)4 E) 5

16. $\left.\begin{matrix} a=2^{\frac{2}{3}}+x \\ b=x \end{matrix}\right\} \Rightarrow \mathbf{a^3-b^3-3ab(a-b)=?}$

A) 2 B) 4 C) 8 D) 16 E) 64

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	D	E	B	C	A	D	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
E	E	A	B	A	E	E	B

1. $\left.\begin{array}{l}5x-4y=12\\4x-5y=6\end{array}\right\} \Rightarrow x^2-y^2=?$

A) 9 B) 12 C) 15 D) 18 E) 21

2. $x, y, \in R^+$,

$x^2-xy-6y^2=0 \Rightarrow \dfrac{x^2+y^2}{x\cdot y}=?$

A) $\frac{3}{10}$ B) $\frac{7}{10}$ C) $\frac{9}{10}$ D) $\frac{10}{9}$ E) $\frac{10}{3}$

3. $\dfrac{a}{b}+\dfrac{b}{a}=5 \Rightarrow \dfrac{a^4+b^4}{a^2\cdot b^2}=?$

A) 21 B) 23 C) 25 D) 27 E) 29

4. $\left.\begin{array}{l}a^2=3b+7\\b^2=3a+7\end{array}\right\} \Rightarrow a+b=?$

A) –3 B) –2 C) 1 D) 2 E) 3

5. $\left.\begin{array}{l}a+b=3\\a\cdot b=4\end{array}\right\} \Rightarrow \dfrac{a^3+b^3+a\cdot b}{a^2+b^2}=?$

A) –7 B) –5 C) –3 D) 3 E) 5

6. $a=3\sqrt{2}+1 \Rightarrow a^2-2a+9=?$

A) 12 B) 16 C) 18 D) 24 E) 26

7. $x=199996$,

$x^2+8x=a\cdot 10^b-c$

$\Rightarrow a+b+c=?$

A) 10 B) 15 C) 20 D) 30 E) 35

8. $a^2+b^2+4a+6b+13=0$

$\Rightarrow a+b=?$

A) –7 B) –6 C) –5 D) 5 E) 6

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9. $\left.\begin{array}{l}3ab^2 + a^3 = 63 \\ 3a^2b + b^3 = 62\end{array}\right\} \Rightarrow$ **a + b = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

10. $\left.\begin{array}{l}b = a + 4 \\ b^2 = a^2 + 8\end{array}\right\} \Rightarrow$ **3a − b = ?**

A) –6 B) –4 C) –2 D) 4 E) 6

11. $\left.\begin{array}{l}x^3 + y^3 = 45 \\ x + y = 9\end{array}\right\} \Rightarrow$ **3 · x · y = ?**

A) 64 B) 68 C) 72 D) 74 E) 76

12. $\frac{x}{y} - \frac{y}{x} = 2 \Rightarrow \frac{x^6 - y^6}{x^3 \cdot y^3} = ?$

A) 10 B) 12 C) 14 D) 16 E) 18

13. $a^2 - a - 1 = 0 \Rightarrow$ **$a^3 + 1 = ?$**

A) a + 1 B) a + 2 C) 2a D) 2a + 1 E) 2a + 2

14. $\left.\begin{array}{l}a^3 - b^3 = 13 \\ b^3 - c^3 = 17 \\ a - c = 5\end{array}\right\} \Rightarrow (a + c)^2 - ac = ?$

A) 6 B) 8 C) 10 D) 18 E) 20

15. $\left.\begin{array}{l}a(a^2 + 3b^2) = 53 \\ b^3 + 3a^2b = -11\end{array}\right\} \Rightarrow$ **a − b = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

16. $x = 2\sqrt[3]{3} - 1 \Rightarrow x^3 + 3x^2 + 3x = ?$

A) 21 B) 23 C) 25 D) 27 E) 29

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1	2	3	4	5	6	7	8
B	E	B	A	B	E	D	C
9	10	11	12	13	14	15	16
D	A	E	C	E	A	D	B

1. $x = \sqrt[3]{3} - 1 \Rightarrow \mathbf{x^3 + 3x^2 + 3x + 3 = ?}$

A) 3 B) 5 C) 6 D) 10 E) 12

2. $x = \sqrt[3]{5} - 1 \Rightarrow \mathbf{(x+2)^3 - 3(x+2)^2 + 3x + 5 = ?}$

A) 5 B) 10 C) 15 D) 20 E) 25

3. $\left.\begin{array}{l} a + b = 4 \\ a \cdot b = 3 \end{array}\right\} \Rightarrow \mathbf{\dfrac{a^2 + b^2}{|a - b|} = ?}$

A) 1 B) 5 C) 10 D) 15 E) 25

4. $a \neq -3b$,

$a^2 - ab = 12b^2 \Rightarrow \mathbf{\dfrac{2a^2 + 4b^2}{ab} = ?}$

A) 6 B) 8 C) 9 D) 10 E) 12

5. $x - \dfrac{1}{x} = 3 \Rightarrow \mathbf{x^3 - 4x^2 + 2x - 3 = ?}$

A) –4 B) –3 C) 3 D) 4 E) 7

6. $\dfrac{3a}{b} + \dfrac{b}{3a} = 2 \Rightarrow \mathbf{\dfrac{4a^2 + 2b^2}{a(b - a)} = ?}$

A) 9 B) 11 C) 12 D) 15 E) 18

7. $\left.\begin{array}{l} 4x - y = 32 \\ 2\sqrt{x} - \sqrt{y} = 4 \end{array}\right\} \Rightarrow \mathbf{x = ?}$

A) 8 B) 9 C) 12 D) 16 E) 18

8. $a, b > 0$,

$(a+b)^2 - (a-b)^2 = 12 \Rightarrow \mathbf{a \cdot b = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $a, b, c \in \mathbb{R}$,

$\left.\begin{array}{l} b = a+1 \\ 4ab + c^2 = -1 \end{array}\right\} \Rightarrow$ **a = ?**

A) $-\frac{1}{4}$ B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) $\frac{1}{4}$ E) $\frac{1}{6}$

10. $A = x^2 + 4y^2 + 6x - 8y + 16 \Rightarrow$ **min(A) = ?**

A) 3 B) 4 C) 6 D) 8 E) 16

11. $a > 0$, $a^{\frac{1}{6}} + 1 = x \Rightarrow \dfrac{\left(a^{\frac{1}{12}} - 1\right)\cdot\left(a^{\frac{1}{12}} + 1\right)}{a^{\frac{1}{3}} - 1} = ?$

A) $\frac{1}{x}$ B) $\frac{1}{\sqrt{x}}$ C) $\frac{1}{x^2}$ D) $\sqrt{x}$ E) x^2

12. $x - \dfrac{2}{x+2} = 4 \Rightarrow x^2 + 4x + 4 + \dfrac{4}{(x+2)^2} = ?$

A) 20 B) 28 C) 32 D) 36 E) 40

13. $\left.\begin{array}{l} a+b = 8 \\ a = 5 - bc \\ b = 5 + ac \end{array}\right\} \Rightarrow$ **$a^2 + b^2 = ?$**

A) 20 B) 25 C) 30 D) 35 E) 40

14. $a, b \in \mathbb{Z}^+$

$a^3 - b^3 = 19 \Rightarrow$ **a·b = ?**

A) 3 B) 6 C) 9 D) 12 E) 15

15. $a + b + c = 0$,

$a \cdot b \cdot c = 12$

$\Rightarrow$ **$(a + b)^2 \cdot (b + c)^2 \cdot (a + c)^2 = ?$**

A) 64 B) 81 C) 100 D) 121 E) 144

16. $a + b + c = 0$,

$a \cdot b \cdot c = -20$

$\Rightarrow$ **$(a + b)^3 \cdot (a + c)^3 \cdot (b + c)^3 = ?$**

A) –8000 B) –1000 C) –800 D) 1000 E) 8000

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1	2	3	4	5	6	7	8
B	A	B	C	A	B	B	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	A	A	E	E	B	E	E

1. $x^2+\frac{1}{x^2}=5 \Rightarrow \left|x+\frac{1}{x}\right|=?$

A) $\sqrt{5}$ B) $\sqrt{7}$ C) 5 D) 7 E) 14

2. $3^x+3^{-x}=7 \Rightarrow 9^x+9^{-x}=?$

A) 32 B) 36 C) 42 D) 47 E) 49

3. $x^2-4x+1=0 \Rightarrow x^2+\frac{1}{x^2}=?$

A) 8 B) 10 C) 12 D) 14 E) 16

4. $\left.\begin{array}{l} a^2+2ac=44 \\ b^2+2bc=17 \\ c^2+2ab=20 \end{array}\right\} \Rightarrow a+b+c=?$

A) 5 B) 6 C) 7 D) 8 E) 9

5. $\left.\begin{array}{l} x^3+y^3=19 \\ xy(x+y)=-6 \end{array}\right\} \Rightarrow x+y=?$

A) –2 B) –1 C) 1 D) 2 E) 3

6. $x=\sqrt[3]{7}+1$

$\Rightarrow x^3-3x^2+3x+8=?$

A) 9 B) 11 C) 12 D) 15 E) 16

7. $\left.\begin{array}{l} a^3-b^3=45 \\ a^2+ab+b^2=15 \end{array}\right\} \Rightarrow a-b=?$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $\left.\begin{array}{l} a-b=5 \\ a^2+ab+b^2=4 \end{array}\right\} \Rightarrow a^3-b^3=?$

A) 20 B) 21 C) 22 D) 23 E) 24

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9. $\left.\begin{array}{l} a+b=4 \\ a\cdot b=6 \end{array}\right\} \Rightarrow \mathbf{a^3+b^3=?}$

A) –8 B) –6 C) –4 D) 6 E) 8

10. $\left.\begin{array}{l} a-b=3 \\ a\cdot b=7 \end{array}\right\} \Rightarrow \mathbf{a^3-b^3=?}$

A) 30 B) 60 C) 72 D) 90 E) 108

11. $\left.\begin{array}{l} a+b=6 \\ a\cdot b=8 \end{array}\right\} \Rightarrow \mathbf{a^3+b^3=?}$

A) 64 B) 68 C) 70 D) 72 E) 76

12. $\left.\begin{array}{l} a+b=10 \\ a\cdot b=4 \end{array}\right\} \Rightarrow \mathbf{a^3+b^3=?}$

A) 880 B) 860 C) 840 D) 820 E) 800

13. $x+\frac{1}{x}=4 \Rightarrow \mathbf{\frac{x^6+1}{x^3}=?}$

A) 50 B) 51 C) 52 D) 53 E) 54

14. $x-\frac{2}{x}=4 \Rightarrow \mathbf{x^3-\frac{8}{x^3}=?}$

A) 64 B) 72 C) 88 D) 90 E) 96

15. $x^2-3x+1=0 \Rightarrow \mathbf{\frac{x^6+1}{x^3}=?}$

A) 6 B) 12 C) 15 D) 18 E) 24

16. $2x-\frac{1}{x}=6 \Rightarrow \mathbf{8x^3-\frac{1}{x^3}=?}$

A) 216 B) 220 C) 232 D) 246 E) 252

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1	2	3	4	5	6	7	8
B	D	D	D	C	D	C	A
9	10	11	12	13	14	15	16
A	D	D	A	C	C	D	E

1. $a \cdot b = 10, \ \frac{1}{a} - \frac{1}{b} = \frac{7}{10} \ \Rightarrow \ \mathbf{a^2 + b^2 = ?}$

A) 65 B) 66 C) 67 D) 68 E) 69

2. $x^2 - 5x - 3 = 0 \ \Rightarrow \ \mathbf{x^2 + \frac{9}{x^2} = ?}$

A) 30 B) 31 C) 32 D) 33 E) 34

3. $A \in R^+$,

$\frac{x^2}{y^2} + \frac{y^2}{x^2} = 62 \ \Rightarrow \ \mathbf{A = \frac{x}{y} + \frac{y}{x} = ?}$

A) 4 B) 8 C) 12 D) 16 E) 20

4. $\left.\begin{matrix} a + b = 4 \\ a \cdot b = 3 \end{matrix}\right\} \Rightarrow \mathbf{a^3 + b^3 = ?}$

A) 26 B) 27 C) 28 D) 29 E) 30

5. $\left.\begin{matrix} 3^x - 3^y = 9 \\ 9^x - 9^y = 135 \end{matrix}\right\} \Rightarrow \mathbf{3^{x+y} - 3^{x-y} = ?}$

A) 9 B) 12 C) 21 D) 32 E) 36

6. $\left.\begin{matrix} a + 2b = 6 \\ a \cdot b = 2 \end{matrix}\right\} \Rightarrow \mathbf{a^3 + 8b^3 = ?}$

A) 180 B) 154 C) 152 D) 144 E) 120

7. $a \cdot b = a + b = 5 \ \Rightarrow \ \mathbf{a^3 + b^3 = ?}$

A) 25 B) 30 C) 35 D) 40 E) 50

8. $a^3 - b^3 = 387$ ve (and) $a - b = 3$

$\Rightarrow \mathbf{a \cdot b = ?}$

A) 30 B) 35 C) 40 D) 45 E) 50

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9. $x \neq 0$,

$x - \frac{1}{x} = 2 \Rightarrow \mathbf{x^3 - \frac{1}{x^3} = ?}$

A) 8 B) 10 C) 12 D) 14 E) 16

10. $\left.\begin{matrix} x^3 + y^3 = 12 \\ x \cdot y = 2 \end{matrix}\right\} \Rightarrow \mathbf{x^6 + y^6 = ?}$

A) 100 B) 110 C) 120 D) 124 E) 128

11. $\left.\begin{matrix} x + y = 4 \\ x^2 + y^2 = 12 \end{matrix}\right\} \Rightarrow \mathbf{x^3 + y^3 = ?}$

A) 16 B) 24 C) 36 D) 40 E) 48

12. $\left.\begin{matrix} a^2 + b^2 = 16 \\ a - b = 2 \end{matrix}\right\} \Rightarrow \mathbf{a^3 - b^3 = ?}$

A) 22 B) 33 C) 44 D) 55 E) 64

13. $\left.\begin{matrix} a \neq b \\ a^3 - b^3 = a^2 - b^2 \\ a + b = 3 \end{matrix}\right\} \Rightarrow \mathbf{a \cdot b = ?}$

A) 3 B) 6 C) 9 D) 12 E) 15

14. $\left.\begin{matrix} a^6 - b^6 = 57 \\ a^4 + a^2b^2 + b^4 = 19 \end{matrix}\right\} \Rightarrow \mathbf{a^2 - b^2 = ?}$

A) 3 B) 5 C) 7 D) 9 E) 11

15. $x^2 = x + 1$

$\Rightarrow \mathbf{\frac{x^3 + 3}{x^2 + 1} = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

16. $\mathbf{\frac{a^{12} - 1}{a^8 + a^4 + 1} = ?}$

A) a^2 B) $a^2 - 1$ C) a^4 D) $a^4 - 1$ E) $a^3 + 1$

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1	2	3	4	5	6	7	8
E	B	B	C	D	D	E	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	E	D	C	B	A	B	D

1. $\frac{x^2-y^2}{x+y}+y=?$

A) x B) x – y C) x + y D) y E) xy

2. $\frac{x-\frac{4}{x}}{\frac{x-2}{x}}=?$

A) x – 1 B) x – 2 C) x D) x + 1 E) x + 2

3. $\frac{a^3b-a^2b^2}{b^2-a^2}\cdot\left(\frac{ab}{a+b}\right)^{-1}=?$

A) 1 – a B) –a C) a – 1 D) a – b E) –b

4. $\frac{x^2-2xy}{2y^2-xy}=?$

A) –x·y B) $\frac{-y}{x}$ C) $\frac{-x}{y}$ D) $\frac{x}{y}$ E) x·y

5. $\frac{(a^2-a)^2}{(1-a)^2}=?$

A) a B) a^2 C) a – 1 D) a + 1 E) 2a

6. $x^2-x+1=0 \Rightarrow x^5=?$

A) –x B) –1 C) 1 – x D) x – 1 E) 1

7. $\frac{(x+2)^2-5^2}{x+7}=?$

A) x + 7 B) x + 2 C) x – 2 D) x – 3 E) x – 7

8. $\frac{x^2+1-2x}{x^2-1}=?$

A) $\frac{x}{x+1}$ B) $\frac{x+1}{x}$ C) $\frac{x-1}{x+1}$ D) $\frac{x-1}{x}$ E) $\frac{x}{x-1}$

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9. $\dfrac{4x^2-9y^2}{4x^2-12xy+9y^2}=\dfrac{1}{2} \Rightarrow \dfrac{x}{y}=?$

A) $-\dfrac{9}{2}$ B) $-\dfrac{7}{2}$ C) $-\dfrac{5}{2}$ D) $\dfrac{5}{2}$ E) $\dfrac{9}{2}$

10. $\dfrac{x^2-y^2}{x^2+2xy+y^2} : \dfrac{x-y}{x^3+y^3}=?$

A) $x-y$ B) $x+y$ C) x^2-xy+y^2 D) x^2+xy+y^2 E) x^2+y^2

11. $\dfrac{(x+y)^2-4xy}{x^2-xy}=4 \Rightarrow \dfrac{y}{x}=?$

A) -3 B) $-\dfrac{1}{3}$ C) $\dfrac{1}{3}$ D) 3 E) 4

12. $\dfrac{(x-2)\cdot(x^2+2x+4)+7}{x^2-1}=\dfrac{3}{2} \Rightarrow x=?$

A) $-\dfrac{1}{4}$ B) $-\dfrac{1}{2}$ C) $\dfrac{1}{2}$ D) $\dfrac{1}{4}$ E) $\dfrac{1}{6}$

13. $\dfrac{x^2+2xy}{-2y^2-xy}=?$

A) $-\dfrac{x}{y}$ B) $-\dfrac{y}{x}$ C) $-xy$ D) xy E) $\dfrac{x}{y}$

14. $\dfrac{x^{2a}-1}{x^a+1}=?$

A) x^a B) $x-1$ C) $x+1$ D) x^a-1 E) x^a+1

15. $\left(\dfrac{1}{x-y}-\dfrac{1}{x+y}\right)\cdot\dfrac{(x+y)^2}{y}=?$

A) 2 B) $\dfrac{2}{x-y}$ C) $2(x+y)$ D) $\dfrac{x+y}{x-y}$ E) $\dfrac{2(x+y)}{x-y}$

16. $\dfrac{x(y^2+1)+y(x^2+1)}{x^2\cdot y^2-1}=?$

A) $x+y$ B) $x-y$ C) $\dfrac{x+y}{xy-1}$ D) $\dfrac{x+y}{xy+1}$ E) $\dfrac{x-y}{xy-1}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	E	B	C	B	C	D	C
9	10	11	12	13	14	15	16
A	C	A	B	A	D	E	C

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1. $\left(\frac{x+2}{2-x}\right) : \left(1+\frac{4}{x-2}\right) = ?$

A) –1 B) 0 C) 1 D) 2 E) 3

2. $\frac{a}{a+b} + \frac{b}{a-b} - 1 = ?$

A) $\frac{2b^2}{a^2-b^2}$ B) $\frac{2a^2}{a^2-b^2}$ C) $\frac{a^2}{a^2-b^2}$ D) $\frac{b^2}{a^2-b^2}$ E) $\frac{1}{a^2-b^2}$

3. $\frac{mx^2-mx}{x^2-1} \cdot \frac{x^2+2x+1}{mx+m} = ?$

A) m B) x C) x – 1 D) x + 1 E) mx

4. $\frac{(2a^2-2b^2)\cdot(4a^2+12ab+9b^2)}{(a+b)\cdot(2a+3b)\cdot(4a+6b)} = ?$

A) $\frac{1}{a+b}$ B) $\frac{1}{a-b}$ C) a + b D) a – b E) 2a – b

5. $\frac{x+4}{x-4} : \frac{x^2-16}{x^2-8x+16} = ?$

A) x + 4 B) x – 4 C) $\frac{1}{x-4}$ D) $\frac{1}{x+4}$ E) 1

6. $\frac{a^2b-b^2a}{a^2-b^2} - \frac{2a}{a+b} = ?$

A) ab + 2a B) ab – 2a C) $\frac{ab+2a}{a+b}$ D) $\frac{ab-2a}{a+b}$ E) $\frac{a+b}{ab+2a}$

7. $\left(1-\frac{1}{x}\right) : \left(\frac{1-\frac{1}{x^2}}{1+\frac{1}{x}}\right) = ?$

A) –1 B) $\frac{x+1}{x}$ C) 1 D) $\frac{x-1}{x}$ E) $\frac{x}{x-1}$

8. $\frac{2a^2+4a}{3a-2} \cdot \frac{3a^2+a-2}{a^2+3a+2} = ?$

A) $\frac{2a}{a-2}$ B) 2a C) $\frac{2a}{a+2}$ D) –2a E) $\frac{2a}{3a-2}$

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9. $\dfrac{a^3b-2a^2b^2+ab^3}{ba^3-ab^3}=?$

A) $\dfrac{a-b}{a+b}$ B) $\dfrac{a+b}{a-b}$ C) a + b D) a – b E) $\dfrac{1}{a+b}$

10. $\left(\dfrac{x}{y}+\dfrac{y}{x}-2\right):\left(\dfrac{x-y}{xy}\right)=?$

A) x – y B) y – x C) x + y D) $\dfrac{x}{y}$ E) $\dfrac{y}{x}$

11. $\dfrac{x^2+8}{x^3-8}+\dfrac{2}{x^2+2x+4}=?$

A) $\dfrac{1}{x^2+2x+4}$ B) $\dfrac{1}{x-2}$ C) x + 2 D) $\dfrac{1}{x+2}$ E) x – 2

12. $\left(\dfrac{2a^2+5a-3}{9-a^2}\right)\cdot\left(\dfrac{4a^2-1}{a^2-6a+9}\right)^{-1}=?$

A) $\dfrac{1}{3a-1}$ B) $\dfrac{2a+1}{a-3}$ C) $\dfrac{3+a}{2a+1}$ D) $\dfrac{3-a}{2a+1}$ E) 1

13. $\dfrac{a^2}{a+\dfrac{1}{1-\dfrac{1}{a}}}=?$

A) a B) a + 1 C) a – 1 D) a^2 E) 1

14. $\dfrac{4a^3b-24a^2b+36ab}{8a^2b^2-72b^2}=?$

A) $\dfrac{a(a-3)}{2a+3}$ B) $\dfrac{a-3}{a+2}$ C) $\dfrac{a+3}{a-3}$ D) $\dfrac{a(a-3)}{a+b}$ E) $\dfrac{a(a-3)}{2ab+6b}$

15. $\dfrac{x^2-xy}{x^3+y^3}:\dfrac{x-y}{x^3-x^2y+xy^2}=?$

A) $\dfrac{x}{x^2+y^2}$ B) $\dfrac{2xy}{x+y}$ C) $\dfrac{x^2}{6(x+y)}$ D) $\dfrac{y}{x+y}$ E) $\dfrac{x^2}{x+y}$

16. $\dfrac{3x+4}{x^2-4x}=\dfrac{A}{x}+\dfrac{B}{x-4}$

$\Rightarrow$ **A + B = ?**

A) 3 B) 4 C) 6 D) 8 E) 9

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1	2	3	4	5	6	7	8
A	A	B	D	E	D	C	B
9	10	11	12	13	14	15	16
A	A	B	D	C	E	E	A

1. $\left(a+\dfrac{1}{a+b}\right)\cdot\left(\dfrac{a+b}{a(a+b)+1}\right)=?$

A) 0 B) 1 C) 2 D) 3 E) 4

2. $\left(\dfrac{a^3+a^2b+b^2a}{a^2-ab+b^2}:\dfrac{a^3-b^3}{a^3+b^3}\right)\cdot\dfrac{a-b}{a+b}=?$

A) 1 B) a C) a + 1 D) a + b E) a – b

3. $\dfrac{9x^2-81}{3x-9}\cdot\dfrac{3}{x+3}=?$

A) 1 B) 3 C) 6 D) 9 E) 12

4. $\dfrac{m^2-n^2}{2m+2n}:\dfrac{4m^2-8mn+4n^2}{8(m+n)}=?$

A) 1 B) m + n C) m – n D) $\dfrac{m-n}{m+n}$ E) $\dfrac{m+n}{m-n}$

5. $\dfrac{(x-y)^2-(x+y)^2}{xy^2-x^2y}\cdot\dfrac{x-y}{4}=?$

A) –2 B) –1 C) 0 D) 1 E) 2

6. $\dfrac{1-\dfrac{1}{x}}{1+\dfrac{1}{x}}-\dfrac{-2}{x+1}+1=?$

A) –2 B) –1 C) 0 D) 1 E) 2

7. $\dfrac{a^3b^2+a^2b^3}{a^2b-ab^2}\cdot\dfrac{a-b}{ab}=?$

A) a B) ab C) a – b D) a + b E) 2

8. $\dfrac{1-\dfrac{1}{x^2}}{\dfrac{1+x}{x}}:\dfrac{1-x}{x}=?$

A) –2 B) –1 C) 0 D) 1 E) 2

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9. $\left(\dfrac{a}{a-b}-\dfrac{b}{a+b}\right)\cdot\left(\dfrac{a^2-b^2}{a^2+b^2}\right)=?$

A) –1 B) 1 C) a D) –a E) a – b

10. $\dfrac{x^2-16}{4x-16}\cdot\dfrac{8x}{2x+8}=?$

A) 1 B) 2 C) x D) x – 1 E) x + 1

11. $\dfrac{2a^2+3a+1}{2a^2+a}\cdot\dfrac{a^2-a}{a-1}=?$

A) 1 B) 2 C) a D) a – 1 E) a + 1

12. $x^2+y^2+6y-4x+13=0$

$\Rightarrow$ **x + y = ?**

A) –2 B) –1 C) 1 D) 2 E) 4

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13. $(x+y-24)^6+(x-y+10)^4=0$

$\Rightarrow$ **x·y = ?**

A) 24 B) 45 C) 76 D) 98 E) 119

14. $\dfrac{x^2+xy^2}{xy+y^3}:\dfrac{x}{y}=?$

A) 1 B) 2 C) 3 D) x E) $\dfrac{1}{y}$

15. $\dfrac{2x^2+xy-y^2}{x^2-y^2}\cdot\dfrac{x-y}{4x-2y}=?$

A) $\dfrac{1}{4}$ B) $\dfrac{1}{2}$ C) 1 D) x - y E) x + y

16. $\dfrac{3x^2-x-2}{3x+2}\cdot\dfrac{x}{x-1}=?$

A) x B) $\dfrac{2x-1}{x+1}$ C) $\dfrac{x+3}{x+1}$ D) $\dfrac{x-1}{x+3}$ E) –x

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1	2	3	4	5	6	7	8
B	B	D	E	D	E	D	B
9	10	11	12	13	14	15	16
B	C	E	B	E	A	B	A

1. $\sqrt{a}+\dfrac{1}{\sqrt{a}}=\sqrt{7} \Rightarrow a^2+\dfrac{1}{a^2}=?$

A) 18 B) 19 C) 21 D) 23 E) 25

2. $a-3b=m \Rightarrow a^2+9b^2-1-6ab=?$

A) $m+2$ B) m^2+2 C) m^2-1 D) m^2 E) m^2-2

3. $\dfrac{\dfrac{9}{a^2}-1}{1-\dfrac{3}{a}}+\dfrac{3}{a}=?$

A) $\dfrac{3}{a}$ B) a C) – 1 D) 1 E) –a

4. $\dfrac{a^2b^2-1}{a(b^2+1)+b(a^2+1)}=?$

A) $\dfrac{ab-1}{a+b}$ B) $\dfrac{a+b+1}{a+b}$ C) $\dfrac{ab-1}{ab}$ D) $\dfrac{ab+1}{ab}$ E) $\dfrac{a}{b}$

5. $\dfrac{(a^2+ab)^2}{(a^2-ab)^2}\cdot\left(\dfrac{a^2-2ab+b^2}{a^2+2ab+b^2}\right)=?$

A) $\dfrac{a}{b}$ B) ab C) b D) a E) 1

6. $\dfrac{x^3-y^3}{x^2-y^2}-(x+y)=?$

A) $\dfrac{-xy}{x+y}$ B) $\dfrac{x+2y}{x-y}$ C) $\dfrac{y(x+2y)}{x}$ D) $\dfrac{y(x+2y)}{x-y}$ E) $\dfrac{x+y}{y}$

7. $x+y=2 \Rightarrow x^2+y^2+x^2y+xy^2=?$

A) 0 B) 2 C) 4 D) 6 E) 8

8. $\dfrac{a}{b}+\dfrac{b}{a}=2 \Rightarrow \dfrac{a^4+b^4}{2a^2b^2}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $\dfrac{x^4+4}{(x^2-2x+2)\cdot(3x^2+6x+6)} = ?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) $\frac{1}{6}$

10. $a^3-1=m \Rightarrow a^6-1=?$

A) m^2 B) m^2+2 C) m^2+m D) m^2+2m E) m^2+3m

11. $x^2-x+1=0 \Rightarrow x^3+\dfrac{1}{x^3}=?$

A) 5 B) 3 C) –1 D) –2 E) –4

12. $a=2,\ b=3 \Rightarrow$

$\dfrac{a^2+a+1}{a^3-1}+\dfrac{ab^2-a^2b}{b^2-a^2}\cdot(a+b)=?$

A) 4 B) 5 C) 6 D) 7 E) 8

13. $x+y=3 \Rightarrow \dfrac{x^2-y^2+6x+9}{x^2-y^2+3x+3y}=?$

A) 2 B) 3 C) 4 D) 5 E) 6

14. $\dfrac{a}{a+1}+\dfrac{a}{a-1}-2=?$

A) $\dfrac{4}{a^2-1}$ B) $\dfrac{2}{a^2-1}$ C) $\dfrac{-2}{a^2+1}$ D) $\dfrac{4a^2+2}{a^2+1}$ E) 2

15. $a, b \in N^+$,

$a^2-9b^2=7 \Rightarrow a^3-3a^2b+3ab^2-b^3=?$

A) 3 B) 9 C) 27 D) 64 E) 125

16. $\dfrac{x^2-3}{x-\sqrt{3}}+3-\sqrt{3}=7 \Rightarrow x=?$

A) 1 B) 2 C) 3 D) 4 E) 5

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	C	C	A	E	A	C	A
9	10	11	12	13	14	15	16
B	D	D	D	A	B	C	D

1. $2x - 3y = m$

$\Rightarrow 4x^2 - 12xy + 9y^2 + 2x - 3y = ?$

A) m B) m^2 C) $m^2 + m$ D) $m^2 + 1$ E) $m^2 + 3m$

2. $\frac{a}{b} + \frac{b}{a} = 6 \Rightarrow \frac{a^2 + b^2}{3ab} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

3. $\frac{\frac{4}{x^2} - 1}{1 - \frac{2}{x}} - \left(1 - \frac{2}{x}\right) = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

4. $a + b = m \Rightarrow (a - b)^2 + 4ab = ?$

A) 1 B) m C) $\frac{1}{m}$ D) m^2 E) $\frac{m}{2}$

5. $x^2 - 3x + 1 = 0 \Rightarrow x^3 + \frac{1}{x^3} = ?$

A) 15 B) 16 C) 17 D) 18 E) 19

6. $a^2 + 1 = m \Rightarrow a^4 - 1 = ?$

A) m B) m^2 C) $2m^2$ D) $m^2 + 1$ E) $m^2 - 2m$

7. $x - y = 4 \Rightarrow \frac{x^2 - y^2 + 4x - 4y}{2x + 2y + 8} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $\left.\begin{array}{l} 2a - 5b = 7 \\ x + y = 4 \end{array}\right\} \Rightarrow 2ax - 5by + 2ay - 5bx = ?$

A) 20 B) 24 C) 28 D) 32 E) 36

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9. $x + y = 5$,

$x^3 - y^3 = 4x^2 + 4xy + 4y^2 \Rightarrow \mathbf{x^2 - y^2 = ?}$

A) 16 B) 17 C) 18 D) 19 E) 20

10. $\left(\dfrac{\frac{a}{b}}{\frac{1}{c}} - \dfrac{\frac{c}{b}}{\frac{1}{a}}\right) \cdot \left(\dfrac{\frac{a}{c}}{\frac{1}{b}}\right) = ?$

A) 0 B) 1 C) $\frac{1}{a}$ D) $\frac{b}{c}$ E) $\frac{a}{b}$

11. $x^2 + (a + 1)x + a = (x + 1)(x + 4)$

$\Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

12. $\left(\dfrac{1}{a+1} + \dfrac{1}{a-1}\right) \cdot \left(\dfrac{a^2-1}{a}\right) = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

13. $x, y \in \mathbb{N}$,

$\left.\begin{array}{l} x^2 + a = 18 \\ y^2 + a = 1 \end{array}\right\} \Rightarrow \mathbf{x \cdot y = ?}$

A) 69 B) 70 C) 71 D) 72 E) 73

14. $\left.\begin{array}{l} m \cdot a + m \cdot b = 8 \\ n \cdot a + n \cdot b = 14 \\ a + b = 11 \end{array}\right\} \Rightarrow \mathbf{m + n = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

15. $x^3 - 2x + 4 = 0 \Rightarrow \mathbf{x^2 + \frac{4}{x} = ?}$

A) 5 B) 4 C) 3 D) 2 E) 1

16. $(25^x + 4) \cdot (5^x - 2) \cdot (5^x + 2) = 9 \Rightarrow \mathbf{x = ?}$

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 1 D) $\frac{3}{4}$ E) $\frac{1}{2}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	B	A	D	D	E	B	C
9	10	11	12	13	14	15	16
E	A	D	E	D	B	D	E

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1. $\left.\begin{matrix} x-y=6 \\ x\cdot y=7 \end{matrix}\right\} \Rightarrow \frac{1}{x^2}+\frac{1}{y^2}=?$

A) $\frac{5}{7}$ B) $\frac{50}{49}$ C) 36 D) 20 E) 16

2. $\frac{1-\frac{1}{a}}{1+\frac{1}{a}} : \frac{a-1}{a-\frac{1}{a}} = ?$

A) a – 1 B) $\frac{a-1}{a}$ C) $\frac{1}{a}$ D) a + 1 E) $a^2 - 1$

3. $a^2+\frac{4}{a^2}=m \Rightarrow \left(a-\frac{2}{a}\right)^2=?$

A) 4m B) 2m C) m + 2 D) m + 4 E) m – 4

4. a + b + c = 1,
$\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=0 \Rightarrow a^2+b^2+c^2=?$

A) 4 B) 3 C) 2 D) 1 E) 0

5. $\left(\frac{x}{y-x}+\frac{y}{x+y}\right) : \left(\frac{y^3+yx^2}{y^2x-x^3}\right)=?$

A) x B) $\frac{x}{y}$ C) y D) $\frac{y}{x}$ E) xy

6. $\left(\frac{x+2}{x-2}-\frac{x-2}{x+2}\right) : \frac{x}{x^2+x-6}=?$

A) $\frac{8(x+3)}{x+2}$ B) $\frac{2}{x+3}$ C) $\frac{x^2+3x}{x+2}$ D) $\frac{1}{x^2+5x+6}$ E) $\frac{x+3}{x^2+2x}$

7. y > 0,
$\frac{3x^2-3xy+y^2}{y^2}=7 \Rightarrow \max(x)=?$

A) $\frac{y}{2}$ B) $\frac{3y}{4}$ C) y D) $\frac{3y}{2}$ E) 2y

8. m ≠ n,
$\frac{1+\frac{m}{x}}{\frac{n}{x}-1}=\frac{n}{m} \Rightarrow x=?$

A) n – m B) –m C) –n D) 1 E) 0

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9. $\left.\begin{array}{l} x^2-y^2=12 \\ y^2-z^2=4 \\ x-z=2 \end{array}\right\} \Rightarrow (x-z)^2+4xz=?$

A) 4 B) 16 C) 32 D) 64 E) 144

10. $\dfrac{a^2+a}{a+1}+\dfrac{a^2-4a+4}{a-2}=-6 \Rightarrow a=?$

A) –2 B) –1 C) $-\dfrac{1}{2}$ D) $-\dfrac{1}{3}$ E) $-\dfrac{1}{4}$

11. $\dfrac{a^2+a-5}{a-7}+\dfrac{8-4a}{a^2-9a+14}-\dfrac{a^2-2}{a-7}=?$

A) $\dfrac{1}{a+1}$ B) $\dfrac{1}{a+2}$ C) a – 1 D) a + 1 E) 1

12. $\dfrac{(x^4-1)\cdot(x^4-x^2+1)}{x^6+1}=?$

A) x^2+1 B) x^4-x^2+1 C) x^2-1 D) x – 1 E) x + 1

13. $\left(\dfrac{x^2-y^2}{2x+2y-x^2+y^2}-\dfrac{2}{2+y-x}\right)=?$

A) $-\dfrac{2x}{x+y}$ B) –x C) x D) –1 E) 1

14. $\left.\begin{array}{l} x=3,25 \\ y=2,75 \end{array}\right\} \Rightarrow \dfrac{(x-y)^2+4xy}{2(x+y)}=?$

A) 1 B) $\dfrac{3}{2}$ C) 2 D) $\dfrac{5}{2}$ E) 3

15. $\dfrac{x}{x+1}-\dfrac{1-x}{x^2-1}=?$

A) 2 B) 1 C) 0 D) –1 E) –2

16. $\dfrac{x-\dfrac{1}{x^2}}{1-\dfrac{1}{x}}\cdot x-1=?$

A) x^2-x B) x C) 1 D) x^2 E) x^2+x

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	B	E	D	B	A	E	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	A	E	C	D	E	B	E

1. $A = m^2 - 6m + 10$

$\Rightarrow$ **min(A) = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

2. $\dfrac{(3a-2b)^2-(3a+2b)^2}{(a+b)^2-(a-b)^2} = ?$

A) –5 B) –6 C) –7 D) –8 E) –9

3. $\dfrac{mn+mk+pn+pk}{2n+2k} = 6,\ \ m-p=6 \ \Rightarrow\ \mathbf{m = ?}$

A) 6 B) 7 C) 8 D) 9 E) 10

4. $\dfrac{x^2-(a+2)x+2a}{x^2-a^2} = 1 \ \Rightarrow\ \mathbf{a = ?}$

A) –2 B) –1 C) 0 D) 1 E) 2

5. $\dfrac{x+y}{xy} = \dfrac{1}{x-y} \ \Rightarrow\ \mathbf{x^2-y^2-xy = ?}$

A) –2 B) –1 C) 0 D) 1 E) 2

6. $\dfrac{x^2-2x-8}{x^2+4x+4} \cdot \dfrac{x^2-5x+6}{x^2-7x+12} = ?$

A) 1 B) x + 2 C) x – 2 D) $\dfrac{x+2}{x-2}$ E) $\dfrac{x-2}{x+2}$

7. **$(6{,}102 + 2{,}102)^2 - 4(6{,}102 \cdot 2{,}102) = ?$**

A) 1 B) 2 C) 4 D) 16 E) 32

8. $\left.\begin{aligned} 2a-b &= 8 \\ x-2y &= 4 \end{aligned}\right\} \Rightarrow\ \mathbf{2ax-4ay-bx+2by-2 = ?}$

A) 30 B) 31 C) 32 D) 33 E) 34

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9. $a = 2001 \Rightarrow a^2 - 2a = ?$

A) 10^3 B) 10^6 C) $10^6 - 1$ D) $2 \cdot 10^6$ E) $4 \cdot 10^6 - 1$

10. $\frac{x^6 - y^6}{x^2 - y^2} \cdot \frac{1}{x^2 - xy + y^2} : (x^2 + xy + y^2) = ?$

A) 1 B) $x - y$ C) $x + y$ D) $x^2 - xy + y^2$ E) $x^2 - y^2$

11. $\left(\frac{a^2}{4} - \frac{ab}{2} + \frac{b^2}{4}\right) \cdot \left(\frac{16}{a^2 - b^2}\right) = ?$

A) 1 B) 2 C) 4 D) $\frac{4}{a-b}$ E) $\frac{4(a-b)}{a+b}$

12. $x + \frac{1}{x+1} = 6 \Rightarrow (x+1)^2 + \frac{1}{(x+1)^2} = ?$

A) 40 B) 44 C) 47 D) 49 E) 54

13. $\left.\begin{array}{l} x = \sqrt{2} - 1 \\ y = \sqrt{2} + 1 \end{array}\right\} \Rightarrow \frac{(x-y)^2 + 4xy}{x - y} = ?$

A) –4 B) –2 C) 0 D) 2 E) 4

14. $\left.\begin{array}{l} a^2 + ab = 16 \\ ab - b^2 = 10 \end{array}\right\} \Rightarrow a^2 + b^2 = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

15. $x^2 + y^2 - 8x + 6y + 25 = 0$

$\Rightarrow x \cdot y = ?$

A) 12 B) 8 C) 4 D) –8 E) –12

16. $\left.\begin{array}{l} a^2 + b^2 + c^2 = 24 \\ a \cdot b + b \cdot c + a \cdot c = \frac{25}{2} \end{array}\right\} \Rightarrow |a + b + c| = ?$

A) 3 B) 1 C) 0 D) 5 E) 7

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	B	D	A	C	E	D	A
9	10	11	12	13	14	15	16
E	A	E	C	A	C	E	E

1. $x \neq 0,$

$x + x^{-1} = 5 \Rightarrow \left|x - \frac{1}{x}\right| = ?$

A) 3 B) $\sqrt{15}$ C) 4 D) $\sqrt{21}$ E) 5

2. $\left(\frac{a+2}{2-a} - 1\right) \cdot \left(1 - \frac{4}{a^2}\right) = ?$

A) $\frac{a+2}{a}$ B) $\frac{a-1}{a}$ C) $\frac{2a-2}{a}$ D) $\frac{-2a-4}{a}$ E) $\frac{2a-4}{a}$

3. $a^2 = a + 1 \Rightarrow a^5 + 2a = ?$

A) a + 1 B) 3a + 2 C) 6a + 5 D) 7a + 3 E) 9a + 1

4. $\frac{a}{a-1} - \frac{a}{1 - \frac{1}{a}} = ?$

A) –2a B) –a C) a D) 2a E) 3a

5. $2^{\frac{1}{6}} + 1 = a \Rightarrow \frac{\left(2^{\frac{1}{12}} - 1\right) \cdot \left(2^{\frac{1}{12}} + 1\right)}{2^{\frac{1}{3}} - 1} = ?$

A) –a B) $-\frac{1}{a}$ C) 1 D) $\frac{1}{a}$ E) a

6. $\left.\begin{array}{l} a + b = 6 \\ c - a = 2 \end{array}\right\} \Rightarrow a^2 + ab - ac - bc = ?$

A) –12 B) –9 C) –6 D) 9 E) 12

7. $\frac{x^2 - 2x + a}{x^2 + 2x + b} = \frac{x-5}{x-1} \Rightarrow a + b = ?$

A) –18 B) –10 C) 0 D) 10 E) 8

8. $\frac{2789^3 - 1}{2789^2 + 2789 + 1} = ?$

A) 1789 B) 2780 C) 2788 D) 2789 E) 2790

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9. $16x^2 + 9y^2 - 40x + 12y + 29 = 0$

$\Rightarrow \mathbf{4x - 6y = ?}$

A) 1 B) 3 C) 5 D) 7 E) 9

10. $x - \frac{1}{x} = 6 \Rightarrow \frac{x^6 - 1}{x^3} = ?$

A) 200 B) 210 C) 216 D) 227 E) 234

11. $a^2 + b^2 + 6a - 6b + 18 = 0$

$\Rightarrow \mathbf{b - a = ?}$

A) 2 B) 4 C) 6 D) 8 E) 10

12. $\frac{ab^2 - a^2b}{a^3b - 2a^2b^2 + ab^3} = ?$

A) $a - b$ B) $\frac{1}{a-b}$ C) $\frac{1}{b-a}$ D) $\frac{a^2}{b-a}$ E) $\frac{b^2}{a-b}$

13. $a - \frac{a+1}{\frac{1}{a}+1} = ?$

A) $-\infty$ B) 0 C) 1 D) a E) a + 1

14. $x - y = 3,$

$x + z = 5$

$\Rightarrow \mathbf{x^2 - yz - xy + xz = ?}$

A) 2 B) 5 C) 7 D) 12 E) 15

15. $x, y \in \mathbb{Z},$

$x^2 - y^2 - 2x + 1 = 13 \Rightarrow \mathbf{x \cdot y = ?}$

A) 4 B) 8 C) 26 D) 36 E) 48

16. $\frac{x^2 - 2xy}{x^2 + y(y - x)} : \frac{x^2 - xy - 2y^2}{x^3 + y^3} = ?$

A) x B) x^2 C) $x - y$ D) $x + y$ E) x^2y^2

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	D	D	B	D	A	A	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
E	E	C	C	B	E	E	A

1. $\left(\dfrac{a^3-b^3}{a-b}-\dfrac{a^3+b^3}{a+b}\right):\dfrac{4ab}{a^2-b^2}=?$

A) $\dfrac{a-b}{2}$ B) $\dfrac{a+b}{2}$ C) $\dfrac{a}{2}$ D) $\dfrac{b}{2}$ E) $\dfrac{a^2-b^2}{2}$

2. $\dfrac{x^2y-y^2x}{y^2-xy}:\dfrac{x^3-3x^2+2x}{x^2-4}=?$

A) $\dfrac{x+2}{1-x}$ B) $\dfrac{x+2}{x-1}$ C) $\dfrac{x-2}{x-1}$ D) $\dfrac{x-2}{1-x}$ E) $x-2$

3. $\dfrac{x^4y-xy^4}{x^2y+xy^2+y^3}\cdot\dfrac{1}{xy-x^2}=?$

A) $x-y$ B) $x+y$ C) -1 D) x^2-y^3 E) 1

4. $\left(7x^2-\dfrac{1}{7}\right):\left(x+\dfrac{1}{7}\right)=?$

A) $x-1$ B) $7x-1$ C) $\dfrac{7x-1}{7}$ D) $\dfrac{7x+1}{7}$ E) $-\dfrac{1}{7}$

5. $\dfrac{3}{\dfrac{1}{x}-1}+\dfrac{2x^2+2x}{x^2-1}=?$

A) $\dfrac{-x}{x-1}$ B) $\dfrac{-x}{x+1}$ C) $\dfrac{x}{x-1}$ D) $\dfrac{x}{x+1}$ E) $\dfrac{-x}{1-x}$

6. $\dfrac{(a-b)^2+ab}{a^3+b^3}=?$

A) $a+b$ B) $a-b$ C) $a\cdot b$ D) $\dfrac{1}{a\cdot b}$ E) $\dfrac{1}{a+b}$

7. $\dfrac{a^2-9a+20}{a^2+2a-24}:\dfrac{5-a}{2a+12}=?$

A) $3-a$ B) $2-a$ C) -2 D) $2+a$ E) $3+a$

8. $\dfrac{a^2+2ab+b^2}{2a-4}\cdot\dfrac{a^2-2a}{a^2+ab}=?$

A) $a-b$ B) $a+b$ C) $\dfrac{a-b}{2}$ D) $\dfrac{a+b}{2}$ E) $a\cdot b$

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9. $\left(\frac{x}{x-1}+\frac{1}{x^2-1}\right):\frac{x^3-1}{x+1}=?$

A) $\frac{1}{x}$ B) $\frac{x}{x-1}$ C) $\frac{x-1}{x}$ D) $\frac{1}{x+1}$ E) $\left(\frac{1}{x-1}\right)^2$

10. $\frac{x^{32}-1}{(x^{16}+1)\cdot(x^8+1)}=?$

A) x^8-1 B) x^8+1 C) $x^{16}-1$ D) $x^{16}+1$ E) x^4-1

11. $\left(\frac{a+1}{a^2+4a+3}-\frac{a-1}{a^2+a-2}\right):\frac{1}{a+2}=?$

A) $\frac{-1}{a-3}$ B) $\frac{-1}{a+3}$ C) $\frac{1}{a-3}$ D) $\frac{1}{a+3}$ E) $\frac{a}{a+3}$

12. $\frac{(x-1)\cdot(x^2+3x+2)}{(x^2-2x+1)\cdot(x+1)}\cdot\frac{x^2-1}{3(x+1)\cdot(x+2)}=?$

A) $\frac{-1}{x}$ B) $\frac{-1}{3}$ C) $\frac{-3}{x}$ D) $\frac{1}{3}$ E) $\frac{1}{x}$

13. $\frac{x^3-xy^2}{x^4-2x^3y+x^2y^2}:\frac{x^2+xy}{(xy-x^2)^2}=?$

A) $-xy$ B) $y-x$ C) $x-y$ D) xy E) $x+y$

14. $\left(\frac{a^2-2a+4}{a+2}-1\right):\left(\frac{a-1}{a+2}\right)=?$

A) $a-1$ B) $a-2$ C) a D) $a+1$ E) $a+2$

15. $\frac{3x^2+6xy-x-2y}{9x^2-6x+1}=?$

A) $\frac{x-2y}{3x-1}$ B) $\frac{2y-x}{3x+1}$ C) $\frac{x+2y}{3x-1}$ D) $\frac{x+2y}{3x+1}$ E) $\frac{x-2y}{3x+1}$

16. $\frac{x^2+\frac{1}{x}}{\frac{1}{x}-x}:\frac{x^2-x+1}{1-\frac{1}{x}}=?$

A) $\frac{-1}{x}$ B) $\frac{-x}{2}$ C) $\frac{x}{2}$ D) $\frac{1}{x}$ E) $\frac{x-1}{x}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	A	C	B	A	E	C	D
9	10	11	12	13	14	15	16
E	A	B	D	C	B	C	A

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1. $\dfrac{x^2-4x}{x^3-9x} : \dfrac{x^2-2x-8}{x^2-x-6} = ?$

A) $\dfrac{-1}{x+3}$ B) $\dfrac{-1}{x-3}$ C) $\dfrac{x-3}{x}$ D) $\dfrac{1}{x-3}$ E) $\dfrac{1}{x+3}$

2. $\dfrac{x^3+2x^2y+xy^2}{x^3-xy^2} : \dfrac{(x^2+xy)^2}{x^3-x^2y} = ?$

A) $\dfrac{-1}{x+y}$ B) $\dfrac{-1}{x-y}$ C) $\dfrac{x+y}{x}$ D) $\dfrac{1}{x+y}$ E) $\dfrac{1}{x-y}$

3. $\dfrac{x^3+y^3}{x^2-y^2} : \dfrac{\frac{x^2}{y}+y-x}{\frac{1}{y}-\frac{1}{x}} = ?$

A) $\dfrac{-1}{y}$ B) $\dfrac{-1}{x}$ C) $\dfrac{x}{x-y}$ D) $\dfrac{1}{x}$ E) $\dfrac{1}{y}$

4. $\dfrac{x^2-9}{3-x} \cdot \left(1+\dfrac{1-x}{x+3}\right) = ?$

A) $x-3$ B) $x+3$ C) 3 D) 4 E) -4

5. $\dfrac{y^2-x^2}{x^2y+xy^2} : \left(\dfrac{x-y}{x} - \dfrac{y-x}{y}\right) = ?$

A) $\dfrac{-1}{x-y}$ B) $\dfrac{-1}{x+y}$ C) $\dfrac{1}{x-y}$ D) $\dfrac{1}{x+y}$ E) $\dfrac{x}{x+y}$

6. $\dfrac{a^2}{a-4} - \dfrac{16-8a}{4-a} = ?$

A) $\dfrac{-a}{a-4}$ B) $\dfrac{-1}{a-4}$ C) $\dfrac{a}{a-4}$ D) $\dfrac{1}{a-4}$ E) $a-4$

7. $\dfrac{\frac{1}{a}-a}{a-\frac{1}{a}} : \dfrac{2}{1-a} = ?$

A) $\dfrac{a-1}{2}$ B) $\dfrac{a-1}{4}$ C) $\dfrac{a+1}{2}$ D) $\dfrac{a+1}{4}$ E) $a+1$

8. $\dfrac{x^2-4x+3}{x^2-1} : \dfrac{x^2-9}{x^2+4x+3} + \dfrac{1}{x} = ?$

A) $\dfrac{-x}{x+1}$ B) $\dfrac{-x}{x-1}$ C) $\dfrac{x+1}{x}$ D) $\dfrac{x}{x-1}$ E) $x+1$

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9. $\dfrac{a^3-3a^2+2a}{a^2-a} : \dfrac{4-a^2}{2a^2+4a} = ?$

A) $-2a$ B) $-a$ C) -2 D) a E) $2a$

10. $\dfrac{1}{a^2-1} + \dfrac{1}{\dfrac{1}{a^2}-1} = ?$

A) $a-1$ B) $a+1$ C) -1 D) $1-a$ E) -2

11. $\dfrac{2x(y-1)-2y}{x+y-xy} = ?$

A) -2 B) -1 C) $x-1$ D) $x+1$ E) $x-y$

12. $(x^4+1)\cdot(x^2+1)\cdot(x+1)\cdot(x-1) = ?$

A) $x+1$ B) x^2+1 C) x^2-1 D) x^4-1 E) x^8-1

13. $\left(\dfrac{a^2-\dfrac{1}{a^2}}{a-\dfrac{1}{a}} - \dfrac{1}{a}\right) : 4a = ?$

A) $\dfrac{-1}{4}$ B) $\dfrac{-1}{2}$ C) $\dfrac{-a}{2}$ D) $\dfrac{1}{4}$ E) $\dfrac{a}{4}$

14. $\dfrac{1+\dfrac{1}{a}}{1-\dfrac{1}{a}} : \dfrac{a^2+2a+1}{a^2-1} = ?$

A) $-a$ B) -1 C) a D) $\dfrac{1}{a}$ E) 1

15. $\left(x^{\frac{1}{16}}+1\right)\cdot\left(x^{\frac{1}{8}}+1\right)\cdot\left(x^{\frac{1}{4}}+1\right)\cdot\left(x^{\frac{1}{2}}+1\right) = \dfrac{A}{x^{\frac{1}{16}}-1}$

$\Rightarrow$ **A = ?**

A) $x-1$ B) x^2-1 C) x^4-1 D) $x+1$ E) x^2+1

16. $1+\dfrac{a-\dfrac{1}{a}}{1+\dfrac{1}{a}} = ?$

A) $a-1$ B) a C) -1 D) 1 E) $a+1$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	D	D	E	B	E	A	C
9	10	11	12	13	14	15	16
A	C	A	E	D	E	A	B

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1. $\left.\begin{matrix} 2x^2+9xy-5y^2=40 \\ x+5y=4 \end{matrix}\right\} \Rightarrow$ **y = ?**

A) 1 B) $\frac{1}{3}$ C) $-\frac{2}{11}$ D) $\frac{3}{13}$ E) $-\frac{3}{10}$

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

2. $\dfrac{\mathbf{x^2-3x-10}}{\left(\frac{2}{x}+1\right)\cdot\left(\frac{5}{x}-1\right)}$ **= ?**

A) $-3x$ B) $-x+2$ C) $-x^2$ D) $x+1$ E) $x-5$

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

3. $(666)^2-(333)^2=(222)^2\cdot m \Rightarrow$ **m = ?**

A) 4 B) $\frac{11}{3}$ C) $\frac{9}{2}$ D) 6 E) $\frac{27}{4}$

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

4. $\left.\begin{matrix} A=4831\cdot4836 \\ B=4829\cdot4838 \end{matrix}\right\} \Rightarrow$ **A – B = ?**

A) 7 B) 14 C) 28 D) 34 E) 35

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

5. $\left.\begin{matrix} a^2+5a-b^2+5b=14 \\ a+b=2 \end{matrix}\right\} \Rightarrow$ **b = ?**

A) –1 B) 0 C) 1 D) 2 E) 3

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

6. $2x^2+y^2+2xy-4x+4=0 \Rightarrow$ **x + 3y = ?**

A) –8 B) –4 C) 0 D) 4 E) 8

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

7. $\dfrac{12^x+18^x}{3^x+2^x}=36 \Rightarrow$ **x = ?**

A) 2 B) 1 C) 3 D) 5 E) 4

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

8. $\dfrac{\mathbf{x^3-1}}{\mathbf{x^2-1}} : \left(\frac{1}{x}+x+1\right)$ **= ?**

A) $\frac{x^2}{x+1}$ B) $\frac{x}{x^2+x+1}$ C) $\frac{x}{x-1}$ D) $\frac{x}{x+1}$ E) $\frac{x^2}{x-1}$

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $(9^a + 4)\cdot(3^a - 2)\cdot(3^a + 2) = 11$

$\Rightarrow$ **a = ?**

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 1 D) $\frac{3}{4}$ E) $\frac{1}{2}$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

10. $\left(\frac{1+k}{1-k} - \frac{1-k}{1+k}\right)\cdot\left(k - \frac{1}{k}\right) = ?$

A) –2 B) –4 C) 1 D) 2 E) 4

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

11. $\frac{x^2-2}{x-\sqrt{2}} + 2 - \sqrt{2} = 5 \Rightarrow x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

12. $\left.\begin{array}{l} 2^x + 3^x = 4 \\ 4^x + 9^x = 6 \end{array}\right\} \Rightarrow 6^x = ?$

A) $\frac{2}{3}$ B) $2\sqrt{3}$ C) 2 D) $2\sqrt{13}$ E) 5

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

13. $x\cdot(-x\cdot x) + x\cdot(x + 2)\cdot x - 2(x - x^2)\cdot x = ?$

A) $4x^3$ B) $2x^3$ C) $-2x^3$ D) $-3x^3$ E) x^3

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

14. $\frac{x^2+3x+9}{2x+6}\cdot\frac{4x^2-36}{x^3-27} = ?$

A) $\frac{1}{2}$ B) 1 C) 2 D) 3 E) 4

[ERCİYES ÜNİVERSİTESİ – YÖS 2017]

15. $2x - \frac{1}{x} = 6 \Rightarrow 8x^2 + \frac{2}{x^2} = ?$

A) 32 B) 40 C) 64 D) 72 E) 80

[ERCİYES ÜNİVERSİTESİ – YÖS 2017]

16. $\frac{2x^2+x-1}{x^2-1} : \frac{2x^2+5x-3}{x^2+2x-3} = ?$

A) 1 B) $\frac{2x-1}{x+1}$ C) $\frac{x+3}{x+1}$ D) $\frac{x-1}{x+3}$ E) –1

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	C	E	B	B	B	A	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	B	C	E	B	C	E	A

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BÖLÜM CHAPTER 6

TARİHSEL NOT / HISTORICAL NOTE

Boole, George [1815 – 1864]

İngiliz matematikçi, matematiksel mantığın babalarından birisi olarak tanınır. İlk büyük çalışması, 1854'de yayımlanan "Düşünme kurallarının incelenmesi (Investigation of the Laws of Thought)"dir. Boolean cebirleri olarak bilinen sembolik çıkarım türünü geliştirmiştir. Onun De Morgan ve diğerleri ile olan çalışması, modern cebirin gelişmesini sağlamıştır.

British mathematician who was one of the founding fathers of mathematical logic. His major work, published in 1854, is his Investigation of the Laws of Thought. The kind of Symbolic argument that he developed led to the study of so-called Boolean algebras, which are of current significance in computing and algebra. His work, together with that of De Morgan and others, helped to pave the way for the development of modern formal algebra.

ORAN ve ORANTI
RATIOS and PROPORTIONS

Bu bölüm 112 alıştırma sorusu, 222 test sorusu, 16 YÖS sorusu içermektedir.

This chapter includes 112 exercise questions, 222 test questions and 16 YÖS questions.

BÖLÜM / CHAPTER 6

ORAN ve ORANTI / RATIOS and PROPORTIONS

- Oran ve Orantı / Ratios and Proportions .... 295 - 340

BÖLÜM
06
CHAPTER

ORAN VE ORANTI
RATIOS AND PROPORTIONS

Alıştırmalar / Exercises

Oran ve Orantı / Ratios and Proportions

1. $3a = 2b \Rightarrow \frac{a}{b} = ?$

Yanıt / The Answer is $\frac{2}{3}$

2. $4a = 8b \Rightarrow \frac{a}{b} = ?$

Yanıt / The Answer is 2

3. $\frac{a}{5} = \frac{b}{6} \Rightarrow \frac{a}{b} = ?$

Yanıt / The Answer is $\frac{5}{6}$

4. $\frac{m}{6} = \frac{n}{10} \Rightarrow \frac{m}{n} = ?$

Yanıt / The Answer is $\frac{3}{5}$

5. $\frac{m-n}{n} = \frac{4}{7} \Rightarrow \frac{m}{n} = ?$

Yanıt / The Answer is $\frac{11}{7}$

6. $\frac{m}{2m+n} = \frac{2}{5} \Rightarrow \frac{m}{n} = ?$

Yanıt / The Answer is 2

7. $\frac{x+y}{x-y} = \frac{5}{2} \Rightarrow \frac{x}{y} = ?$

Yanıt / The Answer is $\frac{7}{3}$

8. $\frac{2x+y}{3x-y} = \frac{1}{3} \Rightarrow \frac{x}{y} = ?$

Yanıt / The Answer is $-\frac{4}{3}$

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9. $\frac{x}{y} = \frac{3}{5} \Rightarrow \frac{2x+3y}{x} = ?$

Yanıt / The Answer is 7

10. $\frac{a}{2} = \frac{b}{4} \Rightarrow \frac{3a-b}{b} = ?$

Yanıt / The Answer is $\frac{1}{2}$

11. $5m = 8n \Rightarrow \frac{4m+2n}{m-n} = ?$

Yanıt / The Answer is 14

12. $6x = 7y \Rightarrow \frac{x-5y}{2x-4y} = ?$

Yanıt / The Answer is $\frac{23}{10}$

13. $5x = 6y \Rightarrow \frac{x-2y}{-3x+5y} = ?$

Yanıt / The Answer is $-\frac{4}{7}$

14. $3(x-y) = 4y \Rightarrow \frac{2x+y}{x-y} = ?$

Yanıt / The Answer is $\frac{17}{4}$

15. $5x = 2(x+y) \Rightarrow \frac{3x-y}{x+y} = ?$

Yanıt / The Answer is $\frac{3}{5}$

16. $2(a+2b) = 3(2a-b) \Rightarrow \frac{2a+3b}{3a-b} = ?$

Yanıt / The Answer is $\frac{26}{17}$

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17. $\frac{x}{y}=\frac{4}{5},\ \frac{y}{z}=\frac{5}{6}\ \Rightarrow\ \frac{x}{z}=?$

Yanıt / The Answer is $\frac{2}{3}$

18. $\frac{a}{b}=\frac{2}{3},\ \frac{b}{c}=\frac{6}{7}\ \Rightarrow\ \frac{a}{c}=?$

Yanıt / The Answer is $\frac{4}{7}$

19. $\frac{m}{n}=\frac{4}{3},\ \frac{n}{p}=\frac{9}{10}\ \Rightarrow\ \frac{m}{p}=?$

Yanıt / The Answer is $\frac{6}{5}$

20. $x, y, z \in N^-$,

$\frac{x}{y}=\frac{2}{5},\ \frac{z}{y}=\frac{7}{10}\ \Rightarrow\ \max(x+y+z)=?$

Yanıt / The Answer is –21

21. $a, b, c \in N^+$,

$\frac{a}{3}=\frac{b}{4},\ \frac{b}{c}=\frac{3}{5}\ \Rightarrow\ \min(a+b+c)=?$

Yanıt / The Answer is 41

22. $4a=5b,\ 7b=4p\ \Rightarrow\ \frac{a}{p}=?$

Yanıt / The Answer is $\frac{5}{7}$

23. $6x=5y,\ 5z=2y\ \Rightarrow\ \frac{z}{x}=?$

Yanıt / The Answer is $\frac{12}{25}$

24. $a, b, c \in N^+$,

$2a=5b,\quad 4c=9b\quad \Rightarrow\quad \min(a+b+c)=?$

Yanıt / The Answer is 23

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25. $\frac{x}{4} = 3y = \frac{z}{5}$, $x + y + z = 84$

$\Rightarrow$ **x = ?**

Yanıt / The Answer is 36

26. $3a = 5b = 7c$, $a - b + c = 29$

$\Rightarrow$ **a + b − c = ?**

Yanıt / The Answer is 41

27. $3a = 4b = 5c$, $2a + b - c = 43$

$\Rightarrow$ **a + b − 2c = ?**

Yanıt / The Answer is 11

28. $2a = 3b = 7c$, $a - b + 3c = 50$

$\Rightarrow$ **a = ?**

Yanıt / The Answer is 42

29. $2a = 3b = 4c$, $a + b + c = 13$

$\Rightarrow$ $\mathbf{a^2 + b^2 + c^2 = ?}$

Yanıt / The Answer is 61

30. $3a = 4b = 5c$, $a - b + c = 34$

$\Rightarrow$ **a + b − c = ?**

Yanıt / The Answer is 46

31. $3xy = 4xz = 5yz$

$\Rightarrow$ $\frac{x+y}{x-z} = ?$

Yanıt / The Answer is $\frac{9}{2}$

32. $4xy = 10yz = 5xz$

$x + y + z = 76 \Rightarrow$ **x = ?**

Yanıt / The Answer is 40

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33. $3ab = 5bc = 7ac$

$a + 2b + 3c = 14 \Rightarrow$ **c = ?**

Yanıt / The Answer is $\frac{3}{2}$

34. $a : b : c = 2 : 4 : 3$

$\Rightarrow \dfrac{3a + b}{5c} = ?$

Yanıt / The Answer is $\frac{2}{3}$

35. $a : b : c = 4 : 3 : 2$

$\Rightarrow \dfrac{2a + 4b}{a + 2c} = ?$

Yanıt / The Answer is $\frac{5}{2}$

36. $x : y : z = 5 : 7 : 3$

$2x - 4y + 3c = -27 \Rightarrow$ **z = ?**

Yanıt / The Answer is 9

37. $x : y : z = 3 : 4 : 5,$

$z + 2y - 3x = 16 \Rightarrow$ **y = ?**

Yanıt / The Answer is 16

38. $m : n : p = 4 : 3 : 6,$

$2m - 3n + p = 15 \Rightarrow$ **m·n = ?**

Yanıt / The Answer is 108

39. $\frac{a}{3} = \frac{b}{4} = \frac{c}{5},\ a + b - c = 20 \Rightarrow$ **c = ?**

Yanıt / The Answer is 50

40. $\frac{a}{5} = \frac{b}{6} = \frac{c}{7},\ 2a + b - 2c = 16 \Rightarrow$ **c − a = ?**

Yanıt / The Answer is 16

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41. $\frac{2x-3}{4}=\frac{y+3}{6}=k,\ 2x+y=60 \Rightarrow$ **y = ?**

Yanıt / The Answer is 33

42. $\frac{x+4}{5}=\frac{2y-4}{6}=k,\ x+2y=55 \Rightarrow$ **x − y = ?**

Yanıt / The Answer is 4

43. $\frac{x+2}{3}=\frac{y-1}{4}=\frac{z-1}{5}=k$

$x+y+z=36 \Rightarrow$ **z = ?**

Yanıt / The Answer is 16

44. $\frac{a-2}{4}=\frac{b+1}{5}=\frac{c-1}{6}=k$

$a+b-c=27 \Rightarrow$ $\mathbf{\frac{b}{c}}$ **= ?**

Yanıt / The Answer is $\frac{4}{5}$

45. $a-\frac{2}{b}=5,\ b-\frac{2}{a}=6,\ a+b=33 \Rightarrow$ **2a + b = ?**

Yanıt / The Answer is 48

46. $m+\frac{4}{n}=6,\ n+\frac{4}{m}=8,\ n-m=10 \Rightarrow$ **2m − n = ?**

Yanıt / The Answer is 20

47. $x-\frac{3}{y}=10,\ y-\frac{3}{x}=14,\ y-x=8 \Rightarrow$ $\mathbf{\frac{x}{5}-\frac{y}{2}}$ **= ?**

Yanıt / The Answer is –10

48. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=3$

$2a+c+3e=45$

$\Rightarrow$ **2b + d + 3f = ?**

Yanıt / The Answer is 15

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49. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=2$

$3b+2d-5f=5$

$\Rightarrow$ $\mathbf{3a+2c-5e=?}$

Yanıt / The Answer is 10

50. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=4$

$2a-3c+e=64$

$\Rightarrow$ $\mathbf{3d-2b-f=?}$

Yanıt / The Answer is –16

51. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=k$

$\frac{3a+c+4e}{3b+d+t\cdot e}=k$

$\Rightarrow$ $\mathbf{t=?}$

Yanıt / The Answer is 4

52. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=4$

$\Rightarrow$ $\mathbf{\frac{4b+2d-3f}{4a+2c-3e}=?}$

Yanıt / The Answer is $\frac{1}{4}$

53. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=12$

$\Rightarrow$ $\mathbf{\frac{2a+4c+12e}{b+2d+6f}=?}$

Yanıt / The Answer is 24

54. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{1}{4}$

$\Rightarrow$ $\mathbf{\frac{3a+c-2e}{9b+3d-6f}=?}$

Yanıt / The Answer is $\frac{1}{12}$

55. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=4$

$4a+2c+3e=40$

$4b+2d=7$ $\Rightarrow$ $\mathbf{f=?}$

Yanıt / The Answer is 1

56. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=3$

$2a-3c+e=18$

$2b+f=12$ $\Rightarrow$ $\mathbf{c=?}$

Yanıt / The Answer is 6

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57. $\frac{a}{3}=\frac{5}{b}=\frac{c}{7} \Rightarrow$ **a·b + b·c = ?**

Yanıt / **The Answer is 50**

58. $\frac{m}{5}=\frac{6}{n}=\frac{n}{8} \Rightarrow$ **$n^2 - mn = ?$**

Yanıt / **The Answer is 18**

59. $\frac{2}{x}=\frac{3}{y}=\frac{y}{5} \Rightarrow$ **$y^2 - xy = ?$**

Yanıt / **The Answer is 5**

60. $x, y \in R^+$

$\frac{x}{3}=\frac{y}{4}=k$

$x \cdot y = 48 \Rightarrow$ **x = ?**

Yanıt / **The Answer is 6**

61. $x, y \in R^-$

$\frac{x}{6}=\frac{y}{5}=k$

$x \cdot y = 270 \Rightarrow$ **y = ?**

Yanıt / **The Answer is –15**

62. $\frac{a}{3}=\frac{b}{4}=\frac{c}{5}$

$a \cdot b \cdot c = 480$

$\Rightarrow$ **a = ?**

Yanıt / **The Answer is 6**

63. $\frac{a}{2}=\frac{b}{3}=\frac{c}{4}$

$a \cdot b \cdot c = 648$

$\Rightarrow$ **c = ?**

Yanıt / **The Answer is 12**

64. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{2}{5}$

$\Rightarrow \frac{a \cdot c \cdot e}{b \cdot d \cdot f} = ?$

Yanıt / **The Answer is $\frac{8}{125}$**

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65. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=3$

$\Rightarrow \frac{b \cdot d \cdot f}{a \cdot c \cdot e}=?$

Yanıt / The Answer is $\frac{1}{27}$

66. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=2$

$\Rightarrow \frac{a \cdot d \cdot e}{b \cdot c \cdot f}=?$

Yanıt / The Answer is 2

67. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{1}{3}$

$\Rightarrow \frac{a \cdot d \cdot e}{b \cdot c \cdot f}=?$

Yanıt / The Answer is $\frac{1}{3}$

68. $\frac{x}{y}=\frac{y}{z}=\frac{z}{t}=\frac{1}{4}$

$\Rightarrow \frac{t}{x}=?$

Yanıt / The Answer is 64

69. $2x = 3y = 4z$,

$\frac{1}{x}+\frac{1}{y}+\frac{1}{z}=\frac{1}{3} \Rightarrow y=?$

Yanıt / The Answer is 9

70. $3a = 4b = c$,

$\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=\frac{1}{5} \Rightarrow b=?$

Yanıt / The Answer is 10

71. $4a = 5b = 3c$,

$\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=\frac{2}{7} \Rightarrow c=?$

Yanıt / The Answer is 14

72. $5a = 6b = 4c$,

$\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=\frac{3}{7} \Rightarrow a=?$

Yanıt / The Answer is 7

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73. $ab = bc = ac = 4$

$\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = \frac{1}{2}$

$\Rightarrow$ **$a + b + c = ?$**

Yanıt / The Answer is 2

74. $ab = bc = ac = \frac{1}{5}$

$\frac{1}{a} + \frac{1}{b} + \frac{1}{c} = 10$

$\Rightarrow$ **$a + b + c = ?$**

Yanıt / The Answer is 2

75. $\left.\begin{array}{l} \frac{x \cdot y}{z} = 6 \\ \frac{x \cdot z}{y} = 24 \end{array}\right\} \Rightarrow |x| = ?$

Yanıt / The Answer is 12

76. $\left.\begin{array}{l} \frac{a \cdot b}{c} = 10 \\ \frac{c \cdot b}{a} = 40 \end{array}\right\} \Rightarrow |b| = ?$

Yanıt / The Answer is 20

77. $\left.\begin{array}{l} \frac{a \cdot b}{c} = 8 \\ \frac{b \cdot c}{a} = 4 \\ \frac{a \cdot c}{b} = 6 \end{array}\right\} \Rightarrow a^2 + b^2 + c^2 = ?$

Yanıt / The Answer is 104

78. $\left.\begin{array}{l} \frac{a \cdot b}{c} = 6 \\ \frac{b \cdot c}{a} = 7 \\ \frac{a \cdot c}{b} = 9 \end{array}\right\} \Rightarrow a^2 + b^2 + c^2 = ?$

Yanıt / The Answer is 159

79. **A ile B doğru orantılıdır.**

A = 5 iken B = 12 ise B = 36 iken A kaçtır?

A and B are directly proportional. If B = 12 when A = 5, then what is A equal to when B = 36?

Yanıt / The Answer is 15

80. **A ile B + 3 doğru orantılıdır.**

A = 3 iken B = 5 ise B = 21 iken A kaçtır?

A and B + 3 are directly proportional. If B = 5 when A = 3, then what is A equal to when B = 21?

Yanıt / The Answer is 9

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81. **a, b ve c sırasıyla 2,3 ve 4 ile doğru orantılıdır.**

a + b + c = 108 ise b kaçtır?

a, b and c are directly proportional to 2, 3 and 4 respectively. If a + b + c =108, what is b?

Yanıt / The Answer is **36**

---

82. **x, y ve z sırasıyla 5, 2 ve 3 ile doğru orantılıdır.**

x – y + z = 36 ise x kaçtır?

x, y and z are directly proportional to 5, 2 and 3 respectively. If x – y + z=36, what is x?

Yanıt / The Answer is **30**

---

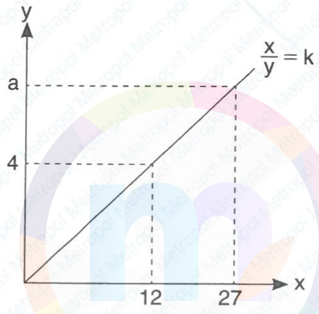
83. **x, y ve z sırasıyla 3, 5 ve 7 ile doğru orantılıdır.**

2x – 3y + 2z = 75 ise z kaçtır?

x, y, and z are directly proportional to 3, 5 and 7 respectively. If 2x – 3y + 2z = 75, what is z?

Yanıt / The Answer is **105**

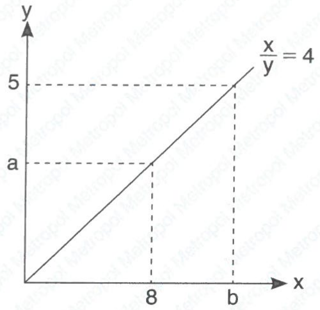
84.



$\Rightarrow$ **a = ?**

Yanıt / The Answer is **9**

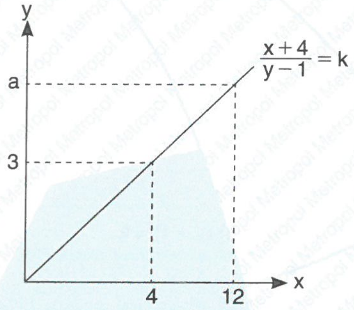
85.



$\Rightarrow$ **a + b = ?**

Yanıt / The Answer is **22**

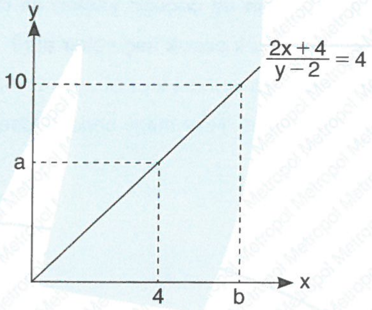
86.



$\Rightarrow$ **a = ?**

Yanıt / The Answer is **5**

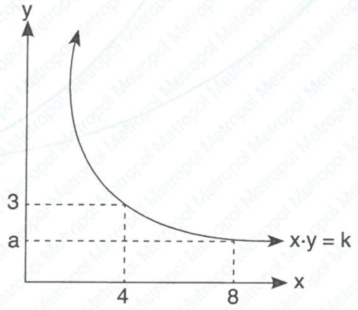
87.



$\Rightarrow$ **b – a = ?**

Yanıt / The Answer is **9**

88.



$\Rightarrow$ **a = ?**

Yanıt / The Answer is $\frac{3}{2}$

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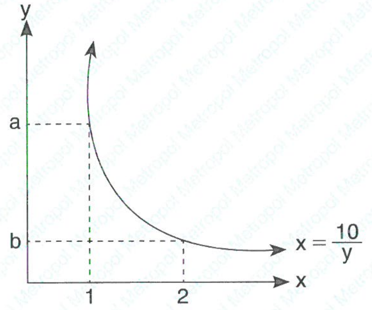
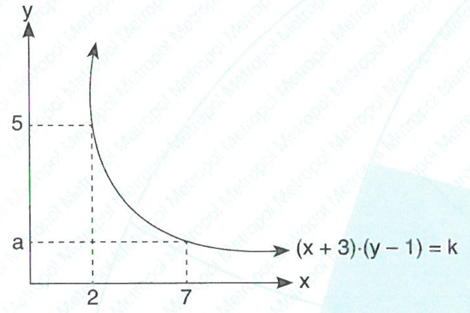
89.



$\Rightarrow$ **a + b = ?**

Yanıt / The Answer is 15

90.



$\Rightarrow$ **a = ?**

Yanıt / The Answer is 3

---

91. **42 şeker yaşları 3, 4 ve 7 olan üç çocuğa yaşları ile doğru orantılı paylaştırılıyor. En büyük çocuk kaç şeker alır?**

42 candies are going to be given to three kids of ages 3, 4 and 7 directly proportional to their ages. How many candies does the biggest kid get?

Yanıt / The Answer is 21

---

92. **120 cm uzunluğundaki bir tel 2, 3 ve 7 ile orantılı olarak üç parçaya ayrılıyor. Buna göre kısa parça kaç cm dir?**

A wire with length of 120 centimeters is going to be cut to pieces with lengthses proportional to 2, 3 and 7. Accordingly, how long is the smallest piece?

Yanıt / The Answer is 20

---

93. **Bir araç sabit hızla 5 saatte 450 km yol gittiğine göre aynı hızla 9 saatte kaç km yol gider?**

If a car can travel 450 km in 5 hours with constant speed, how many kilometers can the car travel in 9 hours?

Yanıt / The Answer is 810

---

94. **Haftada 800 soru çözen bir öğrenci aynı çalışma hızı ile 21 günde kaç soru çözer?**

A student who can solve 800 questions per week can solve, how many questions in 21 days with the same rate?

Yanıt / The Answer is 2400

---

95. **Elif x tane şekere 6 lira, Şeyda 2x – 1 şekere 10,5 lira ödüyor. Buna göre 12 şeker alan Emir kaç lira öder?**

Elif pays 6 liras for x candies and Şeyda pays 10,5 liras for 2x – 1 candies. Accordingly, how much should Emir pay for 12 candies?

Yanıt / The Answer is 18

---

96. **A ile B ters orantılıdır. A = 6 iken B = 8 ise A = 16 iken B kaçtır?**

A and B are inversely proportional. If B = 8 when A = 6, then what is B equal to when A = 16?

Yanıt / The Answer is 3

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97. **A – 1 ile B^2 ters orantılıdır. A = 2 iken B = 6 ise B = 2 iken A kaçtır?**

A – 1 and B^2 are inversely proportional. If B = 6 when a = 2, what is A equal to when B = 2?

Yanıt / The Answer is 10

---

98. **a,b ve c sırasıyla 2, 3 ve 4 ile ters orantılıdır. a + b + c = 130 ise a – b = ?**

a, b, and c are inversely proportional to 2, 3 and 4 respectively. If a + b + c = 130, what is a – b equal to?

Yanıt / The Answer is 20

---

99. **x, y ve z sırasıyla 3,5 ve 7 ile ters orantılıdır. x – y + z = 58 ise y kaçtır?**

x, y and z are inversely proportional to 3, 5 and 7 respectively. If x – y + z = 58, what is y?

Yanıt / The Answer is 42

---

100. **a, b ve c sırasıyla 3, 4 ile doğru 5 ile ters orantılıdır. a + b + c = 72 ise c kaçtır?**

a and b are directly proportional to 3 and 4 respectively and c is inversely proportional to 5. If a + b + c = 72, what is c equal to?

Yanıt / The Answer is 2

---

101. **180 cm uzunluğundaki bir çubuk 3, 4 ve 6 ile ters orantılı olarak kesiliyor. En uzun parça kaç cm dir?**

A rod with length of 180 centimeters is going to be cut to pieces inversely proportional to 3, 4 and 6. It long is the longest piece?

Yanıt / The Answer is 80

---

102. **5 işçi bir işi 12 günde yaptığına göre 10 işci aynı işi kaç günde yapar?**

If 5 workers finish a task in 12 days, in how many days can 10 workers finish the same task?

Yanıt / The Answer is 6

---

103. **Bir uçak saatte 800 km hızla 3 saatte gittiği yolu 600 km hızla kaç saatte gider?**

The distance in which a plane travels in 3 hours at speed of 800 kilometers per hour will take if the plane travels at speed of 600 kilometers per hour?

Yanıt / The Answer is 4

---

104. **Bir araba iki şehir arasındaki yolu V km hızla gittiğinde 4 saatte V + 10 km hızla gittiğinde ise 3 saatte alıyor. Buna göre V kaçtır?**

When traveling at V kilometers per hour, it takes a car 4 hours to travel the distance between two cities, and it takes 3 hours to travel the same distance if the car goes at a speed of V + 10 kilometers per hours. Accordingly, what is V?

Yanıt / The Answer is 30

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105. Bir işi 6 işçi günde 4 saat çalışarak 8 günde bitiriyor. 8 işçi günde 6 saat çalışarak kaç günde bitirir?

6 workers finish a task in 8 days working 4 hours a day. How many days it takes for 8 workers to finish the same task working 6 hours a day?

Yanıt / The Answer is 4

106. Toplamları 108 olan 6 sayının aritmetik ortalaması kaçtır?

What is the arithmetic mean of 6 numbers with sum of 108?

Yanıt / The Answer is 18

107. Aritmetik ortalaması 12 olan 5 sayının toplamı kaçtır?

What is the sum of 5 numbers with arithmetic mean of 12?

Yanıt / The Answer is 60

108. Aritmetik ortalaması 17 olan 7 ardışık tek sayının en büyüğü kaçtır?

What is the biggest one a many 7 consecutive odd numbers with arithmetic mena of 17?

Yanıt / The Answer is 23

109. Aritmetik ortalaması 22 olan 5 sayıya, toplamları 74 olan 3 sayı daha eklenirse yeni arıtmetik ortalama kaçtır?

If 3 new numbers with sum of 74 are added to 5 numbers with arithmetic mean of 22, what will be the new arithmetic mean?

Yanıt / The Answer is 23

110. Geometrik ortalaması 16 olan iki sayıdan biri 32 ise diğeri kaçtır?

If one of two numbers with geometric mean of 16 is 32, what is the other one?

Yanıt / The Answer is 8

111. Geometrik ortalaması aritmetik ortalamalarına eşit olan iki sayının farkı kaçtır?

What is the difference of two numbers in which their arithmetic mean and geometric mena are equal?

Yanıt / The Answer is 0

112. Geometrik ortalaması 10 olan üç sayıdan ikisi 5 ve 40 ise diğer sayı kaçtır?

Geometric mean of three numbers is 10. if tow of these numbers are 5 and 40, what is the other number?

Yanıt / The Answer is 5

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1. $\frac{x}{5} = \frac{2}{y} \Rightarrow$ **x·y = ?**

A) 2 B) 5 C) 10 D) 15 E) 20

2. $\frac{a}{8} = \frac{9}{b} \Rightarrow$ **a·b = ?**

A) 68 B) 72 C) 76 D) 80 E) 84

3. $\frac{a^2}{9} = \frac{3}{a} \Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

4. $\frac{a}{b} = 3 \Rightarrow \frac{3a+2b}{a-2b} = ?$

A) 9 B) 11 C) 13 D) 15 E) 17

5. a : 4 = b : 5, a + b = 18

$\Rightarrow$ **b − a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

6. $\frac{a}{2} = \frac{b}{5} \Rightarrow \frac{4a-b}{2a-b} = ?$

A) 2 B) 0 C) −1 D) −2 E) −3

7. a : b = 3 : 5 $\Rightarrow \frac{b^2-a^2}{4ab} = ?$

A) $\frac{1}{15}$ B) $\frac{2}{15}$ C) $\frac{1}{5}$ D) $\frac{4}{15}$ E) $\frac{1}{3}$

8. $\frac{a+3b}{b} = \frac{7}{2} \Rightarrow \frac{a}{b} = ?$

A) $\frac{1}{2}$ B) 1 C) 2 D) $\frac{5}{2}$ E) 3

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9. $\left.\begin{aligned}\frac{a+b}{2}=7\\ \frac{a-b}{3}=2\end{aligned}\right\} \Rightarrow \mathbf{a=?}$

A) 10 B) 9 C) 8 D) 7 E) 6

10. $\frac{a+b}{9}=\frac{a-b}{3} \Rightarrow \frac{\mathbf{a}}{\mathbf{b}}=\mathbf{?}$

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

11. $\frac{x+2y}{x-y}=\frac{4}{3} \Rightarrow \frac{\mathbf{x}}{\mathbf{y}}=\mathbf{?}$

A) 8 B) 9 C) 10 D) 11 E) 12

12. $\frac{x+3}{6}=\frac{y+1}{2} \Rightarrow \frac{\mathbf{x}}{\mathbf{y}}=\mathbf{?}$

A) 5 B) 4 C) 3 D) 2 E) 1

13. $\frac{a}{\frac{b}{c}}=\frac{4}{b} \Rightarrow \frac{\mathbf{a \cdot c}}{\mathbf{2}}=\mathbf{?}$

A) 1 B) 2 C) 3 D) 4 E) 5

14. $\frac{a-b}{a+b}=\frac{5}{6} \Rightarrow \frac{\mathbf{a^2-b^2}}{\mathbf{a^2+b^2}}=\mathbf{?}$

A) $\frac{36}{25}$ B) $\frac{60}{61}$ C) $\frac{121}{61}$ D) $\frac{25}{36}$ E) $\frac{339}{20}$

15. $\frac{a}{b}=\frac{c}{d}=3 \Rightarrow \frac{\mathbf{a+b}}{\mathbf{a-b}}+\frac{\mathbf{c+d}}{\mathbf{c-d}}=\mathbf{?}$

A) 2 B) 3 C) 4 D) 5 E) 6

16. $a>0$,

$\left.\begin{aligned}\frac{a}{7}=\frac{b}{5}\\ a \cdot b=140\end{aligned}\right\} \Rightarrow \mathbf{a-b=?}$

A) 1 B) 2 C) 3 D) 4 E) 5

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	B	C	B	B	E	D	A
9	10	11	12	13	14	15	16
A	C	C	C	B	B	C	D

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1. $\frac{a}{2}=\frac{b}{5}=4 \Rightarrow \mathbf{a+b=?}$

A) 16 B) 20 C) 24 D) 28 E) 32

3. $\frac{a}{b}=\frac{c}{d}=\frac{3}{4} \Rightarrow \frac{\mathbf{a+2b}}{\mathbf{b}}+\frac{\mathbf{2c-d}}{\mathbf{d}}=?$

A) $\frac{13}{4}$ B) $\frac{11}{21}$ C) $\frac{9}{4}$ D) $\frac{7}{4}$ E) $\frac{5}{4}$

2. $\frac{x}{y}=\frac{z}{t}=\frac{1}{2} \Rightarrow \frac{\mathbf{y}}{\mathbf{x}}+\frac{\mathbf{z+t}}{\mathbf{t}}=?$

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) $\frac{5}{2}$ E) $\frac{7}{2}$

4. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{3}{7} \Rightarrow \left(\frac{\mathbf{a+b}}{\mathbf{b}}\right)\cdot\left(\frac{\mathbf{d}}{\mathbf{c+d}}\right)\cdot\left(\frac{\mathbf{f-e}}{\mathbf{e}}\right)=?$

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 1 D) $\frac{4}{3}$ E) $\frac{5}{3}$

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5. $\frac{a}{3}=\frac{b}{4}=\frac{c}{5} \Rightarrow \frac{\mathbf{a\cdot b+b\cdot c}}{\mathbf{a^2+b^2+c^2}}=?$

A) $\frac{9}{25}$ B) $\frac{12}{25}$ C) $\frac{14}{25}$ D) $\frac{16}{25}$ E) 5

6. $\frac{a}{4}=\frac{b}{6}=\frac{c}{8} \Rightarrow \frac{\mathbf{a\cdot b}}{\mathbf{c(a-b)}}=?$

A) $-\frac{1}{2}$ B) $-\frac{1}{3}$ C) $-\frac{3}{2}$ D) $\frac{1}{3}$ E) $\frac{3}{2}$

7. $\frac{a}{3}=\frac{b}{5}=\frac{c}{7}$,

$\frac{3}{a}+\frac{5}{b}+\frac{7}{c}=\frac{1}{3} \Rightarrow \mathbf{a-b=?}$

A) –6 B) –9 C) –12 D) –18 E) –36

8. $a:b:c=3:5:8 \Rightarrow \frac{\mathbf{a+b}}{\mathbf{2c}}=?$

A) 2 B) $\frac{3}{2}$ C) 1 D) $\frac{1}{2}$ E) $\frac{1}{4}$

9. $3a = 5b \Rightarrow \dfrac{2a-3b}{2b-a} = ?$

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 3

10. $3a = 7b \Rightarrow \dfrac{a+3b}{a-b} = ?$

A) 2 B) 4 C) 6 D) 8 E) 12

11. $\left.\begin{matrix} 2a = 5b \\ a^2+b^2 = 116 \end{matrix}\right\} \Rightarrow a = ?$

A) 8 B) 9 C) 10 D) 11 E) 12

12. $\frac{a}{b} = \frac{3}{5},\ \frac{b}{c} = \frac{5}{4} \Rightarrow \dfrac{a+2b}{b-c} = ?$

A) 2 B) 3 C) 5 D) 11 E) 13

13. $\frac{a}{b} = \frac{3}{4},\ \frac{b}{c} = \frac{8}{7} \Rightarrow \dfrac{a+b-c}{a-b+c} = ?$

A) $\frac{4}{5}$ B) 1 C) $\frac{6}{5}$ D) $\frac{7}{5}$ E) $\frac{8}{5}$

14. $\frac{a}{b} = \frac{3}{8},\ \frac{b}{c} = \frac{4}{5} \Rightarrow \frac{a}{c} = ?$

A) $\frac{3}{5}$ B) $\frac{3}{10}$ C) $\frac{3}{11}$ D) $\frac{4}{15}$ E) $\frac{5}{16}$

15. $\frac{a}{b} = \frac{2}{5},\ \frac{b}{c} = \frac{3}{4}$

$a+b+c = 82 \Rightarrow a = ?$

A) 10 B) 11 C) 12 D) 13 E) 14

16. $\left.\begin{matrix} \frac{a}{b} = \frac{1}{3},\ \frac{b}{c} = \frac{2}{3} \\ c-a-b = 4 \end{matrix}\right\} \Rightarrow a = ?$

A) 8 B) 7 C) 6 D) 5 E) 4

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	A	E	D	D	C	D	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
A	B	C	E	E	B	C	A

1. $\left.\begin{array}{l}2x = 3y \\ 6y = 7z\end{array}\right\} \Rightarrow \dfrac{x}{z} = ?$

A) $\dfrac{7}{2}$ B) $\dfrac{7}{4}$ C) 1 D) $\dfrac{7}{10}$ E) $\dfrac{7}{12}$

2. $\left.\begin{array}{l}4a = 7b \\ 3b = c\end{array}\right\} \Rightarrow a : b : c = ?$

A) 7 : 4 : 12 B) 4 : 7 : 12
C) 3 : 4 : 12 D) 3 : 4 : 7
E) 12 : 7 : 4

3. $4a = 5b,\ 3a = 2c,$
$2a - b + c = 54 \Rightarrow a = ?$

A) 15 B) 20 C) 25 D) 30 E) 35

4. $\left.\begin{array}{l}3x = 7y \\ 5y = 6z \\ x + y - z = 60\end{array}\right\} \Rightarrow x = ?$

A) 21 B) 35 C) 42 D) 48 E) 56

5. $a : 12 : b = 3 : 6 : 5 \Rightarrow a + b = ?$

A) 12 B) 16 C) 20 D) 24 E) 26

6. $a : b : c = 2 : 3 : 5$
$2a + 3b - c = 32 \Rightarrow b = ?$

A) 12 B) 10 C) 8 D) 6 E) 4

7. $3x = 4y = 6z \Rightarrow \dfrac{x + y}{z} = ?$

A) 1 B) 2 C) $\dfrac{5}{2}$ D) 3 E) $\dfrac{7}{2}$

8. $3x = 5y = 8z,$
$x + y + z = 79 \Rightarrow x + y = ?$

A) 40 B) 48 C) 56 D) 64 E) 72

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9. $2a = 4b = 5c,$

$2a - 3b + 4c = 63 \Rightarrow$ **b = ?**

A) 15 B) 12 C) 9 D) 6 E) 3

10. $x, y, z \in Z^+,$

$3x = 5y = 6z$

$\Rightarrow$ **min(x + y + z) = ?**

A) 18 B) 19 C) 20 D) 21 E) 22

11. $a, b, c \in Z^-,$

$7a = 2b = 9c$

$\Rightarrow$ **max(a + b + c) = ?**

A) –95 B) –90 C) –86 D) –82 E) –30

12. $5xy = 7xz = 12yz$

$x + y - z = 56 \Rightarrow$ **x = ?**

A) 44 B) 46 C) 48 D) 50 E) 52

13. $2 \cdot a \cdot b = 3 \cdot b \cdot c = 7 \cdot a \cdot c \Rightarrow \frac{a+b}{c} = ?$

A) 5 B) 6 C) 7 D) 8 E) 12

14. $\left.\begin{matrix} 4xy = 5xz = 7yz \\ x + y + z = 64 \end{matrix}\right\} \Rightarrow$ **x = ?**

A) 16 B) 20 C) 24 D) 28 E) 32

15. $\left.\begin{matrix} \frac{1}{6xy} = \frac{1}{3xz} = \frac{1}{5yz} \\ x - 2y + z = 25 \end{matrix}\right\} \Rightarrow$ **x + y = ?**

A) 40 B) 37 C) 34 D) 31 E) 28

16. $x, y, z \in R^+,$

$\frac{3}{2xy} = \frac{1}{4yz} = \frac{2}{5xz} \Rightarrow$ **? < ? < ?**

A) y < z < x B) x < y < z C) z < x < y

D) y < x < z E) z < y < x

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	A	B	E	B	A	E	D
9	10	11	12	13	14	15	16
A	D	A	C	A	D	A	E

1. $\left.\begin{matrix} \frac{a}{4}=\frac{b}{5}=\frac{c}{6} \\ b+c-a=14 \end{matrix}\right\} \Rightarrow \mathbf{a+c-b=?}$

A) 3 B) 5 C) 8 D) 10 E) 13

2. $\frac{a}{5}=\frac{b}{6}=\frac{c}{7}=2 \Rightarrow \mathbf{a+b-c=?}$

A) 16 B) 14 C) 12 D) 10 E) 8

3. $\left.\begin{matrix} \frac{a}{2}=\frac{b}{3}=\frac{c}{5} \\ a+b+c=100 \end{matrix}\right\} \Rightarrow \mathbf{a=?}$

A) 20 B) 17 C) 15 D) 13 E) 11

4. $\frac{a}{2}=\frac{b}{3}=c,$

$a+b+c=30 \Rightarrow \mathbf{c=?}$

A) 1 B) 2 C) 3 D) 4 E) 5

5. $\left.\begin{matrix} \frac{a}{4}=\frac{b}{5}=\frac{c}{6} \\ a-2b+3c=72 \end{matrix}\right\} \Rightarrow \mathbf{a=?}$

A) 24 B) 28 C) 30 D) 36 E) 40

6. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{4}{5} \Rightarrow \mathbf{\frac{a+c+e}{b+d+f}=?}$

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) 1

7. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=6 \Rightarrow \mathbf{\frac{3a+4c+2e}{3b+4d+2f}=?}$

A) 2 B) 4 C) 6 D) 8 E) 12

8. $\left.\begin{matrix} \frac{a}{b}=\frac{c}{d}=\frac{e}{f}=k \\ \frac{2a+3c-4e}{mb+3d-4f}=k \end{matrix}\right\} \Rightarrow \mathbf{m=?}$

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $\left.\begin{array}{l}\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{1}{4}\\ a+c-e=5\end{array}\right\} \Rightarrow$ **b + d – f = ?**

A) 5 B) 10 C) 15 D) 20 E) 25

10. $\left.\begin{array}{l}\frac{x}{y}=\frac{z}{t}=\frac{5}{8}\\ 2x-3z=10\end{array}\right\} \Rightarrow$ **3t – 2y = ?**

A) –16 B) –10 C) 10 D) 12 E) 16

11. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=9 \Rightarrow \frac{a-c-3e}{2b-2d-6f}=?$

A) $\frac{1}{2}$ B) 1 C) $\frac{9}{2}$ D) 9 E) 18

12. $\left.\begin{array}{l}\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=4\\ 3a+2c-e=84\end{array}\right\} \Rightarrow$ **3b + 2d – f = ?**

A) 21 B) 19 C) 17 D) 15 E) 13

13. $\left.\begin{array}{l}\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=3\\ a+2c+3e=48\\ 2d+3f=12\end{array}\right\} \Rightarrow$ **b = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

14. $\left.\begin{array}{l}\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=3\\ 2a+c-e=24\\ f-d=-6\end{array}\right\} \Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

15. $\frac{2a-4}{a}=\frac{2b+3}{b}=\frac{2c+1}{c}=k \Rightarrow \frac{k}{2}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

16. $\frac{a-2}{3}=\frac{b-3}{2}=\frac{c-5}{4},$

$2a-b+c=22 \Rightarrow$ **a = ?**

A) 8 B) 6 C) 3 D) 2 E) 1

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1	2	3	4	5	6	7	8
D	E	A	E	A	D	C	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	A	C	A	D	C	A	A

1. $\frac{1}{4x}=\frac{3}{2y}=\frac{5}{6z} \Rightarrow$ **x : y : z = ? : ? : ?**

A) 18 : 10 : 3 B) 10 : 18 : 3 C) 3 : 10 : 18 D) 3 : 18 : 10 E) 3 : 18 : 24

2. $\frac{a+b+c}{25}=\frac{a+c}{13}=\frac{b+c}{17} \Rightarrow \frac{b}{c}=?$

A) $\frac{17}{5}$ B) $\frac{12}{5}$ C) $\frac{11}{5}$ D) $\frac{5}{12}$ E) $\frac{5}{11}$

3. $\frac{2a-c}{b}=\frac{2b-a}{a}=\frac{2c-b}{c}=k \Rightarrow$ **k = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

4. $\frac{a}{b}=\frac{b}{c}=\frac{c}{d}=\frac{2}{3} \Rightarrow \frac{a}{d}=?$

A) $\frac{8}{27}$ B) $\frac{5}{27}$ C) $\frac{4}{27}$ D) $\frac{4}{9}$ E) $\frac{2}{3}$

5. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{7}{9} \Rightarrow \frac{a\cdot d\cdot e}{b\cdot c\cdot f}=?$

A) $\frac{1}{9}$ B) $\frac{1}{3}$ C) $\frac{7}{9}$ D) $\frac{49}{81}$ E) 1

6. x, y, z, t ∈ R^+,

$\frac{x}{y}=\frac{y}{z}=\frac{z}{t}=4 \Rightarrow \frac{x}{t}=?$

A) 128 B) 64 C) 32 D) 16 E) 4

7. $\left.\begin{array}{l}\frac{x}{2}=\frac{y}{4}=\frac{z}{6}\\ x\cdot y\cdot z=384\end{array}\right\} \Rightarrow$ **z = ?**

A) 4 B) 8 C) 10 D) 12 E) 16

8. $\left.\begin{array}{l}a+\frac{c}{b}=27\\ b+\frac{c}{a}=9\end{array}\right\} \Rightarrow \frac{b}{a}=?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) 1 D) 2 E) 3

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9. $\left.\begin{array}{l} a+\dfrac{1}{b}=3 \\ b+\dfrac{1}{a}=7 \end{array}\right\} \Rightarrow \dfrac{a}{b}=?$

A) $\frac{3}{7}$ B) $\frac{4}{7}$ C) $\frac{5}{7}$ D) $\frac{6}{7}$ E) 1

10. $\left.\begin{array}{l} a+\dfrac{2}{b}=4 \\ 3b+\dfrac{6}{a}=9 \end{array}\right\} \Rightarrow \dfrac{a^2+b^2}{a\cdot b}=?$

A) $\frac{1}{16}$ B) $\frac{1}{9}$ C) $\frac{25}{12}$ D) $\frac{1}{4}$ E) $\frac{25}{144}$

11. $2a=3b=5c,$

$\dfrac{1}{a}+\dfrac{1}{b}+\dfrac{1}{c}=\dfrac{2}{5} \Rightarrow c=?$

A) 4 B) 5 C) 6 D) 7 E) 8

12. $\left.\begin{array}{l} xa=yb=zc=\dfrac{1}{4} \\ x+y+z=12 \end{array}\right\} \Rightarrow \dfrac{1}{a}+\dfrac{1}{b}+\dfrac{1}{c}=?$

A) 12 B) 24 C) 48 D) 52 E) 60

13. $\left.\begin{array}{l} ax=by=cz=4 \\ a+b+c=36 \end{array}\right\} \Rightarrow \dfrac{1}{x}+\dfrac{1}{y}+\dfrac{1}{z}=?$

A) 4 B) 8 C) 9 D) 12 E) 16

14. $ax=by=cz=91,$

$x+y+z=13$

$\Rightarrow \dfrac{1}{a}+\dfrac{1}{b}+\dfrac{1}{c}=?$

A) $\frac{1}{7}$ B) $\frac{4}{7}$ C) 2 D) 4 E) 7

15. $\left.\begin{array}{l} \dfrac{a\cdot c}{b}=3 \\ \dfrac{a\cdot b}{c}=4 \\ \dfrac{b\cdot c}{a}=5 \end{array}\right\} \Rightarrow a^2+b^2+c^2=?$

A) 45 B) 46 C) 47 D) 48 E) 49

16. $\left.\begin{array}{l} \dfrac{x\cdot y}{z}=6 \\ \dfrac{x\cdot z}{y}=3 \\ \dfrac{y\cdot z}{x}=8 \end{array}\right\} \Rightarrow x^2+y^2+z^2=?$

A) 64 B) 81 C) 90 D) 96 E) 100

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1	2	3	4	5	6	7	8
D	B	A	A	C	B	D	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
A	C	B	C	C	A	C	C

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1. $\frac{a+b}{b} = \frac{3}{4} \Rightarrow \frac{3a-b}{b} = ?$

A) $-\frac{7}{4}$ B) $-\frac{4}{7}$ C) $\frac{4}{7}$ D) $\frac{7}{4}$ E) $\frac{4}{5}$

2. $\frac{a+2b}{a-2b} = 2 \Rightarrow \frac{a+b}{b-a} = ?$

A) $-\frac{9}{5}$ B) $-\frac{7}{5}$ C) $-\frac{5}{7}$ D) $\frac{7}{5}$ E) $\frac{5}{7}$

3. $\frac{a-b}{b} = 2 \Rightarrow \frac{a^2-ab}{a^2+b^2} = ?$

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{5}{2}$ E) $\frac{5}{3}$

4. $a : b : c = 5 : 2 : 6 \Rightarrow \frac{3a-c}{4c-6b} = ?$

A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{1}{3}$ D) $\frac{3}{4}$ E) $\frac{4}{3}$

5. $\frac{2x-y}{x+y} = \frac{3}{2} \Rightarrow \frac{x^2+xy+2y^2}{x^2-y^2} = ?$

A) $\frac{2}{3}$ B) $\frac{3}{4}$ C) $\frac{4}{5}$ D) $\frac{3}{2}$ E) $\frac{4}{3}$

6. $\frac{x}{3} = \frac{y}{2} \Rightarrow \frac{3x+4y}{x-y} = ?$

A) 16 B) 17 C) 18 D) 21 E) 24

7. $x = \frac{y}{3} = \frac{z}{4} \Rightarrow \frac{2x-3y+z}{z-y-2x} = ?$

A) 2 B) 3 C) 4 D) $\frac{1}{3}$ E) $\frac{1}{4}$

8. $x : y : z = 3 : \frac{1}{2} : 4 \Rightarrow \frac{x-4y+z}{x+2y} = ?$

A) $\frac{2}{3}$ B) $\frac{3}{4}$ C) $\frac{4}{5}$ D) $\frac{5}{4}$ E) $\frac{4}{3}$

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9. $\dfrac{2x-3y}{x+y}=1 \Rightarrow \dfrac{\mathbf{3x+y}}{\mathbf{x-y}}=\mathbf{?}$

A) $\frac{10}{3}$ B) $\frac{13}{3}$ C) $\frac{14}{3}$ D) $\frac{16}{3}$ E) $\frac{17}{3}$

10. $\dfrac{a}{2}=\dfrac{b}{3}=\dfrac{c}{5} \Rightarrow \dfrac{\mathbf{2a-b+c}}{\mathbf{2a+b-c}}=\mathbf{?}$

A) $\frac{1}{3}$ B) $\frac{1}{4}$ C) 3 D) 4 E) 5

11. $3a=4b=5c \Rightarrow \dfrac{\mathbf{a+2b-c}}{\mathbf{2a}}=\mathbf{?}$

A) $\frac{13}{20}$ B) $\frac{17}{20}$ C) $\frac{19}{20}$ D) $\frac{7}{10}$ E) $\frac{7}{10}$

12. $\dfrac{a}{b}=\dfrac{c}{d}=\dfrac{e}{f}=5 \Rightarrow \dfrac{\mathbf{a+c+e}}{\mathbf{b+d+f}}=\mathbf{?}$

A) $\frac{1}{5}$ B) $\frac{1}{10}$ C) $\frac{1}{15}$ D) 5 E) 10

13. $\dfrac{x}{a}=\dfrac{y}{b}=2$

$\Rightarrow \left(\dfrac{\mathbf{x+a}}{\mathbf{y}}\right)\cdot\left(\dfrac{\mathbf{2b-3y}}{\mathbf{x}}\right)=\mathbf{?}$

A) –3 B) –2 C) –1 D) 2 E) 3

14. $\left.\begin{array}{l}\dfrac{y}{x}=\dfrac{2}{3}\\ \dfrac{z}{x}=\dfrac{3}{5}\end{array}\right\} \Rightarrow \dfrac{\mathbf{y}}{\mathbf{z-x}}=\mathbf{?}$

A) $-\frac{3}{5}$ B) $-\frac{3}{4}$ C) $-\frac{5}{3}$ D) $-\frac{4}{3}$ E) $-\frac{3}{2}$

15. $\left.\begin{array}{l}\dfrac{x+y}{x}=\dfrac{3}{2}\\ \dfrac{y-z}{z}=\dfrac{1}{2}\end{array}\right\} \Rightarrow \dfrac{\mathbf{x+3z}}{\mathbf{7z-2x}}=\mathbf{?}$

A) –6 B) –4 C) 3 D) 4 E) 6

16. $\left.\begin{array}{l}a+\dfrac{1}{b}=1\\ b+\dfrac{1}{a}=2\end{array}\right\} \Rightarrow \dfrac{\mathbf{a}}{\mathbf{a+b}}=\mathbf{?}$

A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

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1	2	3	4	5	6	7	8
A	B	C	D	E	B	B	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	C	C	D	A	C	E	D

1. $\left.\begin{array}{l}\frac{a}{2}=\frac{b}{3}=\frac{c}{4} \\ a+b+c=18\end{array}\right\} \Rightarrow \mathbf{a+b-c=?}$

A) 1 B) 2 C) 3 D) 4 E) 5

2. $\left.\begin{array}{l}\frac{x}{4}=\frac{y}{5}=\frac{z}{9} \\ x+z-y=24\end{array}\right\} \Rightarrow \mathbf{y=?}$

A) 5 B) 10 C) 15 D) 20 E) 25

3. $a:b:c=5:6:7,$

$a+b+c=36$

$\Rightarrow \mathbf{a=?}$

A) 5 B) 10 C) 15 D) 20 E) 25

4. $x:3=y:5,$

$y-x=8$

$\Rightarrow \mathbf{x=?}$

A) 2 B) 4 C) 6 D) 8 E) 12

5. $\frac{x}{6}=\frac{4}{y}=\frac{z}{3} \Rightarrow \mathbf{y(x+z)=?}$

A) 12 B) 24 C) 36 D) 48 E) 60

6. $\frac{a}{b}=\frac{2}{5}, \frac{b}{c}=\frac{3}{8} \Rightarrow \mathbf{\frac{a}{c}=?}$

A) $\frac{1}{20}$ B) $\frac{1}{10}$ C) $\frac{3}{20}$ D) $\frac{1}{5}$ E) $\frac{1}{4}$

7. $\frac{a}{b}=\frac{3}{7}, \frac{b}{c}=\frac{7}{10}$

$a-b+c=36 \Rightarrow \mathbf{c=?}$

A) 60 B) 50 C) 40 D) 30 E) 20

8. $\frac{3a-2b}{a+b}=\frac{6}{5} \Rightarrow \mathbf{\sqrt{\frac{a}{b}}=?}$

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 1 D) $\frac{4}{3}$ E) $\frac{5}{3}$

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9. $\frac{x-1}{3} = \frac{y+1}{2} = \frac{z}{4}$,
$x+y+z=27 \Rightarrow$ **$x = ?$**

A) 7 B) 10 C) 13 D) 16 E) 19

10. $\frac{a}{b} = \frac{c}{d} = \frac{1}{4} \Rightarrow \mathbf{\frac{a \cdot c}{b \cdot d} : \frac{a}{b} = ?}$

A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{1}{8}$ D) $\frac{1}{16}$ E) $\frac{1}{64}$

11. $\frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{2}{5}$

$\Rightarrow \mathbf{\left(\frac{a}{a+b}\right)\left(\frac{c+d}{d}\right)\left(\frac{e+f}{f}\right) = ?}$

A) $\frac{14}{25}$ B) $\frac{2}{5}$ C) $\frac{7}{25}$ D) $\frac{4}{25}$ E) $\frac{4}{5}$

12. $\frac{\frac{a}{b}}{c} = \frac{\frac{x}{y}}{z} \Rightarrow \mathbf{a \cdot c \cdot y \cdot z = ?}$

A) b B) $\frac{x}{b}$ C) bx D) x E) a · b · x

13. a : b = 3 : 5

$\Rightarrow \mathbf{\frac{(a-b)^2 + 4ab}{(a+b)^2 - 4ab} = ?}$

A) 8 B) 10 C) 12 D) 14 E) 16

14. $\left.\begin{array}{l} \frac{x}{3} = \frac{2}{y} \\ x-y=6 \end{array}\right\} \Rightarrow \mathbf{(x+y)^2 = ?}$

A) 30 B) 40 C) 50 D) 60 E) 70

15. $\left.\begin{array}{l} a \cdot b = 64 \\ b \cdot c = 16 \\ a+c=20 \end{array}\right\} \Rightarrow \mathbf{a = ?}$

A) 10 B) 11 C) 12 D) 16 E) 17

16. $\left.\begin{array}{l} \frac{x}{2} = \frac{y}{3} = z \\ x^2+y^2+z^2=56 \end{array}\right\} \Rightarrow \mathbf{x+y+z = ?}$

A) 3 B) 4 C) 6 D) 9 E) 12

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1	2	3	4	5	6	7	8
B	C	B	E	C	C	A	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	B	A	C	E	D	D	E

1. $\left.\begin{array}{l}\frac{x}{y}=\frac{3}{4}\\ \frac{y}{z}=\frac{3}{5}\end{array}\right\} \Rightarrow \frac{x+y}{y+z}=?$

A) $\frac{3}{20}$ B) $\frac{9}{20}$ C) $\frac{3}{32}$ D) $\frac{9}{32}$ E) $\frac{21}{32}$

2. $\left.\begin{array}{l}\frac{a\cdot c}{b\cdot d}=\frac{1}{3}\\ \frac{c+d}{d}=\frac{4}{3}\end{array}\right\} \Rightarrow \frac{a+3b}{2a-b}=?$

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 2 D) 3 E) 4

3. $\left.\begin{array}{l}x-\frac{3}{y}=5\\ y-\frac{3}{x}=4\end{array}\right\} \Rightarrow \frac{x+y}{x-y}=?$

A) 3 B) 4 C) 5 D) 9 E) 20

4. $\frac{1}{2x}=\frac{3}{4y}=\frac{2}{3z} \Rightarrow x:y:z=?$

A) 8:9:6 B) 6:9:8 C) 2:3:4 D) 3:4:2 E) 2:4:3

5. $\left.\begin{array}{l}\frac{a+b}{2}=c\\ \frac{2a-c}{b}=3\end{array}\right\} \Rightarrow \frac{a}{b}=?$

A) $\frac{3}{7}$ B) $\frac{2}{7}$ C) $\frac{1}{7}$ D) $\frac{7}{2}$ E) $\frac{7}{3}$

6. $\frac{x-y+z}{3}=\frac{x+y-z}{5}=\frac{y+z}{9} \Rightarrow x:y:z=?$

A) 4:5:6 B) 5:4:6 C) 6:5:4 D) 4:5:4 E) 5:4:4

7. $\frac{a}{b}=\frac{c}{d}=k,\ \frac{2a-3c}{2b-xd}=k \Rightarrow x=?$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $\frac{a}{b}=\frac{c}{d}=k,\ \frac{3a+5}{3b+xd}=k \Rightarrow x=?$

A) 3 B) 5 C) $\frac{3}{c}$ D) $\frac{5}{c}$ E) $\frac{c}{5}$

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9. $\frac{x}{y} = \frac{a}{b} = 3 \Rightarrow \frac{x-y}{x} \cdot \frac{a+b}{a} = ?$

A) $\frac{4}{3}$ B) $\frac{4}{3}$ C) $\frac{8}{9}$ D) $\frac{9}{8}$ E) $\frac{4}{9}$

10. $\frac{x-y}{x} = \frac{3y+z}{y} = \frac{x+z}{z} \Rightarrow \frac{3x-3y}{z} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) 3 D) 4 E) 6

11. $\frac{x}{y} = \frac{3}{4}, \frac{y}{z} = \frac{4}{5} \Rightarrow \frac{2x+5y}{3y-z} = ?$

A) $\frac{22}{7}$ B) $\frac{23}{7}$ C) $\frac{24}{7}$ D) $\frac{25}{7}$ E) $\frac{26}{7}$

12. $\frac{a}{b} = \frac{1}{4}, \frac{b}{c} = \frac{2}{5} \Rightarrow \frac{3a-5b}{a+b-2c} = ?$

A) $\frac{7}{5}$ B) $\frac{5}{14}$ C) $\frac{17}{15}$ D) $\frac{15}{14}$ E) $\frac{17}{14}$

13. $\frac{a}{b} = \frac{2}{3}, \frac{b}{c} = \frac{1}{3} \Rightarrow \frac{a^2+b^2}{b \cdot c} = ?$

A) $\frac{8}{27}$ B) $\frac{10}{27}$ C) $\frac{13}{27}$ D) $\frac{15}{27}$ E) $\frac{16}{27}$

14. $\frac{\frac{1}{2}x + \frac{3}{4}y}{y-x} = \frac{1}{4} \Rightarrow \frac{x^2-3xy-4y^2}{(x-4y) \cdot x} = ?$

A) $-\frac{1}{4}$ B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) $\frac{1}{3}$ E) $\frac{1}{4}$

15. $\frac{3x-y}{x+2y} = 1, \frac{y+\frac{z}{4}}{2y-3z} = \frac{1}{4} \Rightarrow \frac{y-x}{z} = ?$

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 1 E) 2

16. $\left.\begin{array}{l} \frac{a}{4} = \frac{b}{5} \\ 5a + 4b = 15 \end{array}\right\} \Rightarrow b = ?$

A) $\frac{8}{15}$ B) $\frac{7}{12}$ C) $\frac{12}{7}$ D) $\frac{13}{8}$ E) $\frac{15}{8}$

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1	2	3	4	5	6	7	8
E	E	D	B	E	D	C	D
9	10	11	12	13	14	15	16
C	E	E	C	C	B	D	E

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1. $\left.\begin{array}{l}\frac{a}{2}=\frac{b}{3}=\frac{c}{4} \\ 3a+2b=48\end{array}\right\} \Rightarrow$ **c = ?**

A) 8 B) 10 C) 12 D) 16 E) 18

2. a : b : c = 3 : 5 : 7,

$2a - b + c = 72 \Rightarrow$ **b = ?**

A) 15 B) 20 C) 35 D) 40 E) 45

3. $\left.\begin{array}{l}\frac{a}{2}=\frac{b}{3}=\frac{c}{5} \\ 2c-3a=52\end{array}\right\} \Rightarrow$ **b = ?**

A) 13 B) 18 C) 26 D) 36 E) 39

4. $\left.\begin{array}{l}\frac{a}{2}=\frac{b}{3}=\frac{c}{5}=k \\ 7a-b+mc=k\end{array}\right\} \Rightarrow$ **m = ?**

A) –4 B) –2 C) 2 D) 3 E) 4

5. $a, b \in Z^+$,

$\left.\begin{array}{l}\frac{a}{b}=\frac{2}{3} \\ a^2-b^2=-125\end{array}\right\} \Rightarrow$ **a = ?**

A) 5 B) 10 C) 15 D) 20 E) 25

6. $x, y, z \in N^+$,

$\left.\begin{array}{l}\frac{x}{2}=\frac{y}{3}=\frac{z}{4} \\ x^2+2y^2-z^2=6\end{array}\right\} \Rightarrow$ **y = ?**

A) 1 B) 2 C) 3 D) 4 E) 6

7. $\left.\begin{array}{l}\frac{x}{3}=\frac{y}{2}=\frac{3z}{4} \\ 3x+y-3z=15\end{array}\right\} \Rightarrow$ **z = ?**

A) $\frac{7}{20}$ B) $\frac{7}{10}$ C) 1 D) $\frac{10}{7}$ E) $\frac{20}{7}$

8. $\left.\begin{array}{l}\frac{x}{2}=\frac{2y}{3}=\frac{3z}{4} \\ 2x+2y-3z=21\end{array}\right\} \Rightarrow$ **x + 2y = ?**

A) 14 B) 21 C) 28 D) 35 E) 42

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9. $\frac{x}{y} = 2,\ \frac{y}{z} = \frac{3}{2},$

$x + z = 16$

$\Rightarrow$ **$x + y - z = ?$**

A) 8 B) 10 C) 12 D) 14 E) 16

10. $\left.\begin{array}{l} \frac{a}{3} = \frac{b}{2} = c \\ 2a + c - 3b = 7 \end{array}\right\} \Rightarrow$ **$c = ?$**

A) 7 B) 8 C) 9 D) 10 E) 12

11. $\frac{x}{2} = \frac{y}{3}$ ve (and) $\frac{y}{z} = \frac{4}{5},$

$x + y + z = 70 \Rightarrow$ **$z = ?$**

A) 10 B) 15 C) 20 D) 25 E) 30

12. $\left.\begin{array}{l} x : y : z = 4 : 5 : 8 \\ \frac{x}{2} - y + z = 15 \end{array}\right\} \Rightarrow$ **$\frac{x + z}{2} = ?$**

A) 9 B) 12 C) 15 D) 18 E) 21

13. $\left.\begin{array}{l} \frac{a+3}{2} = \frac{b-3}{3} = \frac{c}{5} \\ 5a + 2b - c = 24 \end{array}\right\} \Rightarrow$ **$a = ?$**

A) 2 B) 3 C) 4 D) 5 E) 6

14. $\frac{x + y}{y} = \frac{7}{6},\ \frac{y + z}{z} = \frac{5}{2},$

$x + y + z = 55 \Rightarrow$ **$z = ?$**

A) 12 B) 14 C) 16 D) 18 E) 20

15. $\left.\begin{array}{l} \frac{2x}{3} = \frac{4y}{5} = \frac{5z}{4} \\ x \cdot y \cdot z = 12 \end{array}\right\} \Rightarrow$ **$z = ?$**

A) $\frac{5}{8}$ B) $\frac{3}{8}$ C) $\frac{8}{3}$ D) $\frac{8}{5}$ E) $\frac{8}{7}$

16. $\left.\begin{array}{l} \frac{a}{b} = \frac{c}{d} = 4 \\ 3a + 6c = 144 \end{array}\right\} \Rightarrow$ **$b + 2d = ?$**

A) 12 B) 16 C) 18 D) 20 E) 24

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1	2	3	4	5	6	7	8
D	E	E	B	B	C	E	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	A	E	D	B	E	D	A

1. $\frac{x}{4} = \frac{y}{3} = k,\ x + y = 14 \Rightarrow$ **x = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

2. $\frac{a-b}{2} = \frac{a+b}{4} = \frac{a \cdot b}{9} \Rightarrow$ **b = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

3. $\frac{a}{4} = \frac{b}{7} = k,$

$a + b = 121 \Rightarrow$ **a = ?**

A) 28 B) 35 C) 38 D) 44 E) 52

4. $\frac{a}{4} = \frac{b}{3} = \frac{c}{10} = \frac{2a - b + 3c}{4x - 1}$

$\Rightarrow$ **x = ?**

A) 3 B) 4 C) 6 D) 8 E) 9

5. $\left.\begin{array}{l}\frac{a}{3} = \frac{b}{2x} = \frac{x}{4} \\ a \cdot b = 24\end{array}\right\} \Rightarrow$ **a + b = ?**

A) 11 B) 12 C) 13 D) 14 E) 15

6. $\frac{a-1}{b-2} = \frac{2}{3},\ \frac{b+1}{c-1} = \frac{3}{4}$

$\Rightarrow$ **2a − c + 10 = ?**

A) 7 B) 8 C) 9 D) 10 E) 11

7. $\frac{a}{b} = \frac{c}{d} = k$ ve (and)

$\frac{a^2 + a \cdot c}{b^2 + b \cdot d} = 6k - 9 \Rightarrow$ **k = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

8. $\left.\begin{array}{l}\frac{x}{a} = \frac{y}{b} = \frac{z}{c} = \frac{3}{5} \\ 10x - 3y + z = 9\end{array}\right\} \Rightarrow$ **10a − 3b + c = ?**

A) 5 B) 10 C) 15 D) 20 E) 25

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9. $\left.\begin{matrix} ax = by = cz = 12 \\ \dfrac{abc}{ab+ac+bc} = 3 \end{matrix}\right\} \Rightarrow \mathbf{x+y+z=?}$

A) 3 B) 4 C) 6 D) 8 E) 12

10. $\left.\begin{matrix} ax = by = cz \\ a : b : c = 4 : 3 : 2 \\ x + y = 35 \end{matrix}\right\} \Rightarrow \mathbf{z=?}$

A) 15 B) 20 C) 25 D) 30 E) 35

11. $\left.\begin{matrix} \dfrac{a}{x} = \dfrac{b}{y} = \dfrac{c}{z} = \dfrac{2}{5} \\ 2a - 3b + c = 24 \\ z - 3y = 16 \end{matrix}\right\} \Rightarrow \mathbf{x=?}$

A) 22 B) 24 C) 26 D) 28 E) 30

12. $\left.\begin{matrix} \dfrac{a}{x} = \dfrac{b}{y} = \dfrac{c}{z} = \dfrac{5}{7} \\ 2a - 5b + 3c = 60 \\ 2x - 5y = 24 \end{matrix}\right\} \Rightarrow \mathbf{z=?}$

A) 20 B) 24 C) 28 D) 32 E) 36

13. $\left.\begin{matrix} \dfrac{a}{x} = \dfrac{b}{y} = \dfrac{c}{z} = \dfrac{1}{3} \\ 2a + 3b - c = 4 \\ 2x - z = 3 \end{matrix}\right\} \Rightarrow \mathbf{y=?}$

A) 2 B) 3 C) 4 D) 5 E) 6

14. $\left.\begin{matrix} \dfrac{a}{d} = \dfrac{b}{c} = \dfrac{e}{f} \\ \dfrac{a+b+e}{d+c+f} = 3 \end{matrix}\right\} \Rightarrow \mathbf{\dfrac{a^2+be}{d^2+cf} = ?}$

A) 4 B) 5 C) 6 D) 8 E) 9

15. $\dfrac{a}{5} = \dfrac{b}{4} = \dfrac{c}{3},\quad 2a - b + c = 36 \Rightarrow \mathbf{3a - 2c = ?}$

A) 24 B) 30 C) 36 D) 48 E) 60

16. $\left.\begin{matrix} \dfrac{x}{a} = \dfrac{y}{b} = \dfrac{z}{c} = \dfrac{2}{3} \\ 2x - y + 3z = 44 \\ 2a + 3c = 23 \end{matrix}\right\} \Rightarrow \mathbf{b=?}$

A) –43 B) –37 C) –23 D) 23 E) 37

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1	2	3	4	5	6	7	8
C	B	D	E	A	A	C	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	D	A	A	B	E	C	A

1. $x, y, z \in Z^+$,

$\frac{x \cdot y}{6} = \frac{y \cdot z}{4} = \frac{x \cdot z}{3} \Rightarrow$ **min(x + y + z) = ?**

A) 6 B) 9 C) 12 D) 18 E) 36

2. $a, b, c \in N^+$,

$\frac{a \cdot b}{4} = \frac{b \cdot c}{5} = \frac{a \cdot c}{6}$

$41 < a + b + c < 82 \Rightarrow$ **a + b + c = ?**

A) 52 B) 56 C) 68 D) 74 E) 82

3. $\frac{a}{x} = \frac{b}{y} = \frac{c}{z} = 3$,

$4a - 2b + 2c = 36$,

$y - z = 2 \Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

4. $\frac{1}{a} + b = \frac{1}{4}, \quad a + \frac{1}{b} = 3 \Rightarrow$ $\mathbf{\frac{a}{b} = ?}$

A) 3 B) 6 C) 9 D) 12 E) 15

5. $\frac{x}{5} = \frac{3}{0,2}$, $x + 3y = 3 \Rightarrow$ **y = ?**

A) –24 B) –18 C) –12 D) 12 E) 18

6. $\left.\begin{array}{l} \frac{a}{3} = \frac{b}{4} = \frac{c}{5} \\ \frac{a+5}{2b+3c} = \frac{33}{23} \end{array}\right\} \Rightarrow$ **a = ?**

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 2 E) 4

7. $\left.\begin{array}{l} \frac{x}{m} = \frac{y}{n} = \frac{z}{p} = \frac{2}{5} \\ x + 2y - z = 16 \\ m - p = 4 \end{array}\right\} \Rightarrow$ **n = ?**

A) 12 B) 18 C) 24 D) 36 E) 48

8. $\left.\begin{array}{l} \frac{a}{2} = \frac{b}{3} = \frac{c}{4} \\ a \cdot b \cdot c = 192 \end{array}\right\} \Rightarrow$ **a + b + c = ?**

A) 6 B) 9 C) 12 D) 18 E) 24

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9. $\left.\begin{array}{l}\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=2\\ 2a+c-e=14\\ f-d=3\end{array}\right\} \Rightarrow$ **b = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

10. $a \in R^+$,

$\frac{a}{3}=\frac{b}{4}=\frac{c}{5}$, $b \cdot c = 180 \Rightarrow$ **a = ?**

A) 6 B) 9 C) 12 D) 18 E) 20

11. $\left.\begin{array}{l}\frac{x \cdot y}{z \cdot t}=\frac{4}{3}\\ \frac{x \cdot t}{y \cdot z}=\frac{2}{3}\end{array}\right\} \Rightarrow \mathbf{\frac{y^2}{t^2}=?}$

A) 2 B) 4 C) 6 D) 8 E) 10

12. $a-b=\frac{a+b}{7}=\frac{a \cdot b}{24} \Rightarrow$ **a − b = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

13. $\frac{x \cdot y}{3\sqrt{2}}=\frac{y \cdot z}{5\sqrt{2}}=\frac{x \cdot z}{10}=3 \Rightarrow$ **x · y · z = ?**

A) 30 B) 60 C) 90 D) 120 E) 180

14. 2x + xy = k,

x = 2 ⇒ y = 3

x = 1 ⇒ **y = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

15. $\left.\begin{array}{l}\frac{x \cdot y}{z}=4\\ \frac{y \cdot z}{x}=3\\ \frac{x \cdot z}{y}=8\end{array}\right\} \Rightarrow \mathbf{x^2+y^2+z^2=?}$

A) 54 B) 68 C) 72 D) 84 E) 92

16. $\left.\begin{array}{l}ax=by=cz=4\\ x+y+z=12\end{array}\right\} \Rightarrow \mathbf{\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=?}$

A) 1 B) 2 C) 3 D) 4 E) 5

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1	2	3	4	5	6	7	8
B	D	C	D	A	C	B	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	B	A	B	C	D	B	C

1. $\left.\begin{array}{l}2a = 3b = 5c \\ \frac{1}{a}+\frac{1}{b}+\frac{1}{c}=2\end{array}\right\} \Rightarrow$ **a = ?**

A) $\frac{5}{2}$ B) 2 C) $\frac{3}{2}$ D) 1 E) $\frac{1}{2}$

2. $\left.\begin{array}{l}2x = 3y = 4z \\ x \cdot y \cdot z = 576\end{array}\right\} \Rightarrow$ **x + y + z = ?**

A) 20 B) 22 C) 24 D) 26 E) 28

3. $\left.\begin{array}{l}ax = by = cz = 30 \\ \frac{1}{x}+\frac{1}{y}+\frac{1}{z}=3\end{array}\right\} \Rightarrow$ **a + b + c = ?**

A) 30 B) 50 C) 60 D) 80 E) 90

4. $\left.\begin{array}{l}az = bx = cy = 4 \\ x+y+z=16\end{array}\right\} \Rightarrow$ $\mathbf{\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=?}$

A) 2 B) 4 C) 6 D) 8 E) 10

5. xy = 18,
yz = 12,
x + z = 30 $\Rightarrow$ **y = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

6. $\left.\begin{array}{l}\frac{3}{x}=\frac{y}{5}=\frac{z}{2} \\ \frac{2}{x}+y-z=22\end{array}\right\} \Rightarrow$ **2x = ?**

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 4

7. $x, y, z \in \mathbb{Z}^-$,
$\frac{a}{0,6}=\frac{b}{0,5}=\frac{c}{0,7} \Rightarrow$ **? > ? > ?**

A) c > b > a B) b > a > c C) a > c > b D) c > a > b E) b > c > a

8. $\frac{a}{2}=\frac{b}{5}$, $\sqrt{5a}+\sqrt{2b}=16 \Rightarrow$ $\mathbf{\frac{5a}{2}+b=?}$

A) 48 B) 52 C) 56 D) 64 E) 68

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9. $2x = 3y = 6z$,

$\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = \frac{11}{36} \Rightarrow \mathbf{x + y - z = ?}$

A) 20 B) 22 C) 24 D) 26 E) 28

10. $x, y, z \in Z^+$,

$x : y : z = 1 : 2 : 4$,

$x^2 + y^2 + z^2 = 21 \Rightarrow \mathbf{y + z - x = ?}$

A) 5 B) 6 C) 7 D) 8 E) 9

11. $\left.\begin{array}{l} ax = by = cz = \frac{2}{3} \\ xy + xz + yz = 16xyz \end{array}\right\} \Rightarrow \mathbf{a + b + c = ?}$

A) $\frac{22}{3}$ B) $\frac{26}{3}$ C) $\frac{28}{3}$ D) $\frac{32}{3}$ E) $\frac{34}{3}$

12. $\left.\begin{array}{l} x : y : z = 2 : 2 : 5 \\ \frac{x^2 + y^2 + z^2}{2x + y + z} = 6 \end{array}\right\} \Rightarrow \mathbf{x \cdot y + z = ?}$

A) 22 B) 24 C) 26 D) 28 E) 30

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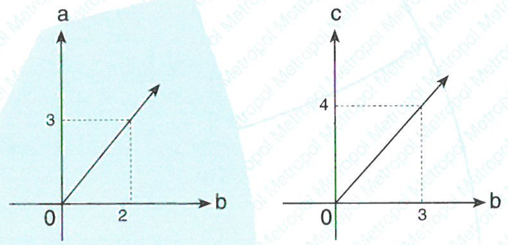
13. $\frac{a}{5} = \frac{b}{4} = \frac{c}{3} = \frac{2a - b + kc}{12} \Rightarrow \mathbf{k = ?}$

A) 2 B) 4 C) 6 D) 8 E) 10

14. $\left.\begin{array}{l} x - \frac{1}{y} = 3 \\ \frac{1}{x} - y = 4 \end{array}\right\} \Rightarrow \mathbf{\frac{x}{y} = ?}$

A) $-\frac{4}{3}$ B) $-\frac{3}{4}$ C) $\frac{3}{4}$ D) $\frac{4}{3}$ E) $\frac{3}{2}$

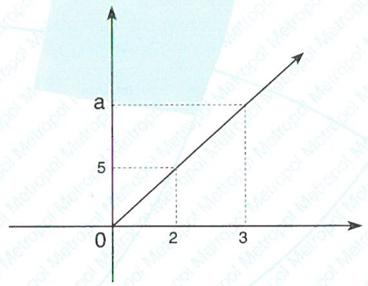
15.



$a + b + c = 46 \Rightarrow \mathbf{a = ?}$

A) 12 B) 16 C) 18 D) 20 E) 24

16.



a = ?

A) 7 B) $\frac{15}{2}$ C) 8 D) $\frac{17}{2}$ E) 9

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1	2	3	4	5	6	7	8
A	D	E	B	A	C	B	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	A	D	C	A	B	C	B

1. $\frac{a}{b}=\frac{c}{d}=\frac{2}{3} \Rightarrow \frac{a\cdot c}{b\cdot d}=?$

A) 1 B) $\frac{2}{3}$ C) $\frac{4}{9}$ D) $\frac{3}{2}$ E) $\frac{9}{4}$

2. $\frac{a}{b}=\frac{b}{c}=\frac{c}{d}=\frac{1}{2} \Rightarrow \frac{a}{d}=?$

A) $\frac{1}{16}$ B) $\frac{1}{8}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

3. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{4}{7} \Rightarrow \frac{a+2c-e}{b+2d-f}=?$

A) $\frac{3}{7}$ B) $\frac{4}{7}$ C) $\frac{5}{7}$ D) $\frac{6}{7}$ E) 1

4. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{6}{5} \Rightarrow \frac{a+c}{b+d}\cdot\frac{f}{e}=?$

A) 1 B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{5}{6}$ E) $\frac{6}{5}$

5. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{2}{5}$,
$a+2c-e=10$
$b-f=6 \Rightarrow 2d=?$

A) 20 B) 19 C) 18 D) 17 E) 16

6. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=12 \Rightarrow \frac{2a-c+3e}{6b-3d+9f}=?$

A) 1 B) 2 C) 3 D) 4 E) 5

7. $3a=4b=5c$,
$\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=\frac{6}{5} \Rightarrow c=?$

A) 2 B) 3 C) 4 D) 5 E) 6

8. $\frac{3a-5}{a}=\frac{3b-2c-a}{b}=\frac{4c-b+5}{c}=k \Rightarrow k=?$

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $\left.\begin{array}{l}\dfrac{a\cdot b}{c}=6\\ \dfrac{a\cdot c}{b}=2\\ \dfrac{b\cdot c}{a}=3\end{array}\right\}\Rightarrow \mathbf{a^2+b^2+c^2=?}$

A) 28 B) 32 C) 34 D) 36 E) 40

10. $\left.\begin{array}{l}x+\dfrac{y}{z}=36\\ z+\dfrac{y}{x}=9\end{array}\right\}\Rightarrow \mathbf{\dfrac{x-z}{z}=?}$

A) 1 B) 2 C) 3 D) 4 E) 5

11. $\left.\begin{array}{l}a\cdot x=b\cdot y=c\cdot z=\dfrac{2}{3}\\ x+y+z=18\end{array}\right\}\Rightarrow \mathbf{\dfrac{1}{a}+\dfrac{1}{b}+\dfrac{1}{c}=?}$

A) 6 B) 12 C) 18 D) 27 E) 36

12. $\dfrac{x}{y}=\dfrac{3}{5}\Rightarrow \mathbf{\dfrac{x^2-y^2}{(x+y)^2}=?}$

A) $-\dfrac{1}{8}$ B) $-\dfrac{1}{4}$ C) $-\dfrac{1}{2}$ D) –1 E) 1

13. $x, y, z \in Z^+$,

$3x = 6y = 9z$

$\Rightarrow$ **min(x + y + z) = ?**

A) 11 B) 17 C) 22 D) 28 E) 33

14. $x, y, z \in Z^-$,

$6x = 8y = 10z$

$\Rightarrow$ **max(x + y + z) = ?**

A) –47 B) –60 C) –64 D) –70 E) –81

15. $\dfrac{a_1}{a_2}=\dfrac{a_2}{a_3}=\ldots=\dfrac{a_n}{a_{n+1}}=4$

$a_1 = 16 \Rightarrow \mathbf{a_4 = ?}$

A) $\dfrac{1}{8}$ B) $\dfrac{1}{6}$ C) $\dfrac{1}{4}$ D) $\dfrac{1}{2}$ E) 1

16. $\left.\begin{array}{l}a+\dfrac{3}{b}=15\\ b+\dfrac{3}{a}=12\end{array}\right\}\Rightarrow \mathbf{\dfrac{a}{b}=?}$

A) $\dfrac{5}{4}$ B) $\dfrac{6}{5}$ C) $\dfrac{7}{6}$ D) $\dfrac{9}{8}$ E) $\dfrac{10}{9}$

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1	2	3	4	5	6	7	8
C	B	B	A	B	D	A	B
9	10	11	12	13	14	15	16
D	C	D	B	A	A	C	A

1. $\frac{x}{y}=\frac{4}{3} \Rightarrow \frac{2y^2-3x^2}{5\cdot xy}=?$

A) $-\frac{1}{4}$ B) $-\frac{1}{3}$ C) $-\frac{1}{2}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

2. $x, y, z \in R^+$,

$x=\frac{y}{2}=\frac{z}{3}, \quad \frac{x\cdot y\cdot z}{x+y+z}=49$

$\Rightarrow z-y+x=?$

A) 7 B) 12 C) 14 D) 18 E) 21

3. $\frac{x}{y}=\frac{m}{n}=4 \Rightarrow \frac{y}{x}\cdot\left(\frac{y-x}{3\cdot y}\right)\cdot\frac{m+n}{n}=?$

A) $-\frac{4}{5}$ B) $-\frac{5}{4}$ C) $\frac{4}{5}$ D) $\frac{5}{4}$ E) $\frac{3}{4}$

4. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=5$, $3a-2c+e=40$,

$2d-f=1 \Rightarrow b=?$

A) –3 B) –2 C) 1 D) 2 E) 3

5. $\frac{x}{y}=\frac{z}{v}=k, \quad \frac{4x-5z}{4y+3}=k \Rightarrow v=?$

A) $-\frac{5}{3}$ B) $-\frac{3}{5}$ C) $-\frac{3}{4}$ D) $\frac{3}{5}$ E) $\frac{5}{3}$

6. $x-\frac{1}{y}=15, \; y-\frac{1}{x}=3 \Rightarrow \frac{y}{x}=?$

A) $\frac{1}{5}$ B) $\frac{1}{3}$ C) $\frac{2}{5}$ D) $\frac{2}{3}$ E) $\frac{3}{5}$

7. $x \neq y$

$\frac{x^2}{2y}=\frac{y^2}{2x}=3 \Rightarrow x+y=?$

A) –6 B) –3 C) –1 D) 3 E) 6

8. $3x=4y=5z$,

$x+y+z=141 \Rightarrow y=?$

A) 30 B) 32 C) 36 D) 45 E) 48

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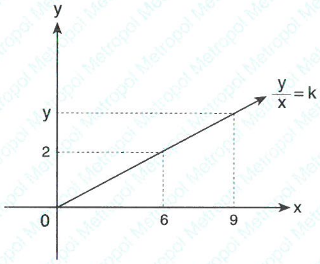
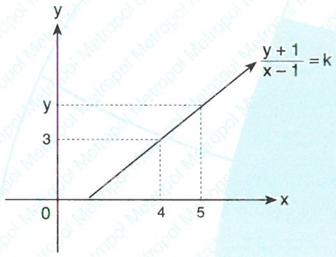
9.



$\Rightarrow$ **y = ?**

A) $\frac{5}{2}$ B) 3 C) $\frac{7}{2}$ D) 4 E) $\frac{9}{2}$

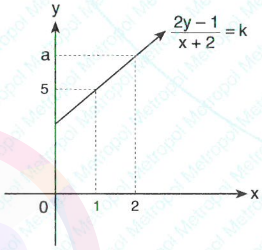
10.



$\Rightarrow$ **y = ?**

A) 4 B) $\frac{13}{3}$ C) $\frac{14}{3}$ D) 5 E) $\frac{16}{3}$

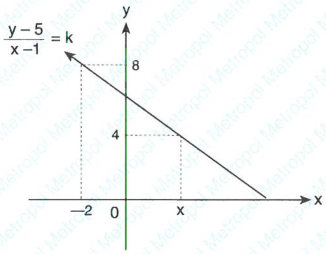
11.



$\Rightarrow$ **a = ?**

A) $\frac{11}{2}$ B) 6 C) $\frac{13}{2}$ D) 7 E) $\frac{15}{2}$

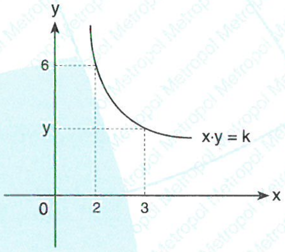
12.



$\Rightarrow$ **x = ?**

A) 1 B) $\frac{3}{2}$ C) 2 D) $\frac{5}{2}$ E) 4

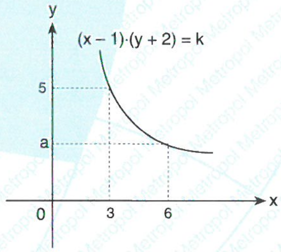
13.



$\Rightarrow$ **y = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

14.



$\Rightarrow$ **a = ?**

A) $\frac{4}{5}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	C	B	E	B	A	A	D
9	10	11	12	13	14		
B	B	C	C	D	A		

1. $\frac{a+b}{3}=b \Rightarrow \frac{2a+b}{3b-a}=?$

A) 1 B) $\frac{5}{2}$ C) $\frac{3}{2}$ D) 3 E) 5

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

2. $\frac{x}{y}=\frac{z}{t}=\frac{k}{p}=3 \Rightarrow \frac{x+y}{y}\cdot\frac{z+t}{t}\cdot\frac{k-p}{p}=?$

A) 64 B) 32 C) 27 D) 9 E) 3

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

3. $x+\frac{1}{y}=3,\ y+\frac{1}{x}=5$

$\Rightarrow \frac{x-3y}{3x+y}=?$

A) $-\frac{6}{7}$ B) $-\frac{2}{9}$ C) $-\frac{1}{2}$ D) $\frac{2}{9}$ E) $\frac{6}{7}$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

4. $\frac{x}{z+5}=\frac{y}{x+1}=\frac{z}{y-2}=\frac{3}{5} \Rightarrow x+y+z=?$

A) 6 B) 10 C) 12 D) 16 E) 20

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

5. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=3 \Rightarrow \frac{a^3\cdot f^2\cdot d^2}{e^2\cdot b^3\cdot c^2}=?$

A) $\frac{1}{9}$ B) $\frac{1}{3}$ C) 1 D) 3 E) 9

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

6. $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}=\frac{1}{4}$

$2a-3c+e=5$

$3d-f=16 \Rightarrow a=?$

A) $\frac{9}{2}$ B) $\frac{15}{2}$ C) 9 D) 15 E) 18

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

7. $\frac{x}{y}=\frac{3}{4},\ \frac{y}{z}=\frac{3}{2} \Rightarrow \frac{y-x}{x-z}=?$

A) $\frac{1}{6}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 2 E) 3

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

8. $a-\frac{1}{b}=5,\ b-\frac{1}{a}=15$

$\Rightarrow \frac{a-b}{a}=?$

A) –2 B) –1 C) 0 D) 1 E) 2

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2017]

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9. $\frac{x}{a} = \frac{y}{b} = \frac{z}{c} = 2$

$a \cdot x + b \cdot y + c \cdot z = 5$

$\Rightarrow \mathbf{a^2 + b^2 + c^2 = ?}$

A) $\frac{2}{5}$ B) 1 C) $\frac{5}{2}$ D) 7 E) 29

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

10. $x + \frac{1}{y} = 2, \quad y + \frac{1}{x} = 5$

$\Rightarrow \mathbf{\frac{x+2y}{x-2y} = ?}$

A) –1,5 B) –1 C) 0 D) 1 E) 1,5

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

11. $\frac{a}{-2} = \frac{b}{-3} = \frac{c}{-4}$

$a - b + c = 3 \;\Rightarrow\; \mathbf{\frac{b \cdot c}{a} = ?}$

A) 5 B) 6 C) 7 D) 8 E) 9

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

12. $\frac{a}{b} = \frac{c}{d} = 12 \;\Rightarrow\; \mathbf{\frac{a-b-c+d}{b-d} = ?}$

A) 10 B) 11 C) 12 D) 13 E) 16

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

13. $x, y, z \in \mathbb{Z}$,

$\left.\begin{array}{l} \frac{x}{y} = \frac{2}{5} \\ \frac{z}{x} = \frac{4}{3} \end{array}\right\} \Rightarrow \mathbf{\frac{3x+2y}{z} = ?}$

A) 4 B) 5 C) 6 D) 7 E) 8

[GİRESUN ÜNİVERSİTESİ – YÖS 2014]

14. $\left.\begin{array}{l} \frac{1}{x} - 3 = y \\ \frac{1}{y} - 5 = x \end{array}\right\} \Rightarrow \mathbf{\frac{x+y}{x-y} = ?}$

A) 1 B) $\frac{1}{8}$ C) $\frac{3}{5}$ D) 4 E) 5

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2013]

15. $2x = 3y = 5z \;\Rightarrow\; \mathbf{\frac{x}{z} = ?}$

A) 1 B) 1,5 C) 2 D) 2,5 E) 3

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2013]

16. $\left.\begin{array}{l} \frac{a}{b} = \frac{c}{d} = \frac{e}{f} = \frac{4}{3} \\ 3a + 2c - e = 32 \\ 2d + 3b = 14 \end{array}\right\} \Rightarrow \mathbf{f = ?}$

A) –10 B) –8 C) –6 D) 6 E) 8

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	B	A	A	B	A	E	A
9	10	11	12	13	14	15	16
C	A	B	B	C	D	D	A

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BÖLÜM CHAPTER 7

TARİHSEL NOT / HISTORICAL NOTE

Abel, Niels Henrik [1802 – 1829]

Norveçli matematikçi, 19 yaşında dörtten büyük dereceli denklemlerin çözülemeyeceğini göstermiştir. Başka bir deyişle, bu denklemlerin ikinci dereceden denklemler gibi formülünün olmadığını kanıtlamıştır. Aynı zamanda cebirsel fonksiyonlar teorisindeki temel gelişmeleri yanıtlamıştır.

Norwegian mathematician who at the age of 19, proved that the general equation of degree greater than 4 cannot be solved algebraically. In other words, there can be no formula for the roots of such an equation similar to the familiar formula for the quadratic equation. He was also responsible for fundamental developments in theory of algebraic functions.

1. DERECEDEN DENKLEMLER
1st ORDER EQUATIONS

Bu bölüm 80 alıştırma sorusu, 192 test sorusu, 16 YÖS sorusu içermektedir.

This chapter includes 80 exercise questions, 192 test questions and 16 YÖS questions.

BÖLÜM / CHAPTER 7

BİRİNCİ DERECEDEN DENKLEMLER / FIRST ORDER EQUATIONS

- Birinci Dereceden Bir Bilinmeyenli Denklemler / First Order Equations In One Variable . . . . 341 - 378

BİRİNCİ DERECEDEN DENKLEMLER
FIRST ORDER EQUATIONS

Alıştırmalar / Exercises

Birinci Dereceden Denklemler / First Order Equations

1. $x + 7 = 27 - x \Rightarrow x = ?$

Yanıt / The Answer is 10

2. $2x - 3 = x + 13 \Rightarrow x = ?$

Yanıt / The Answer is 16

3. $5 - (3x - 1) = x + 13 \Rightarrow x = ?$

Yanıt / The Answer is $-\frac{7}{4}$

4. $2(3x - 1) = 5(x + 4) + 7 \Rightarrow x = ?$

Yanıt / The Answer is 29

5. $6x + [2 - (2x + 1)]2 = 34 \Rightarrow x = ?$

Yanıt / The Answer is 16

6. $3(x - 1) = 2(x + 4) - 5 \Rightarrow x = ?$

Yanıt / The Answer is 6

7. $2(2x - 3) - 3(2 - x) = 23 \Rightarrow x = ?$

Yanıt / The Answer is 5

8. $2[a - (2a - 8)] - 1 = 3a \Rightarrow a = ?$

Yanıt / The Answer is 3

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9. $15 = 2m - \frac{3m}{2} \Rightarrow$ **m = ?**

Yanıt / The Answer is 30

10. $3(a - 2) + x = a + 7$,

$a = 3 \Rightarrow$ **x = ?**

Yanıt / The Answer is 7

11. $x - m = 2[3x - (x - 1)]$,

$x = 4 \Rightarrow$ **m = ?**

Yanıt / The Answer is –14

12. $(4x - 7)\cdot a = 3x - 2(a + 12)$,

$x = 2 \Rightarrow$ **a = ?**

Yanıt / The Answer is –6

13. $\frac{4x-5}{3} = 9 \Rightarrow$ **x = ?**

Yanıt / The Answer is 8

14. $\frac{2x+3}{5} = \frac{x-4}{3} \Rightarrow$ **x = ?**

Yanıt / The Answer is –29

15. $\frac{3x+5}{7} = \frac{x-4}{2} \Rightarrow$ **x = ?**

Yanıt / The Answer is 38

16. $\frac{x-1}{2} + \frac{x}{3} = \frac{1}{4} \Rightarrow$ **x = ?**

Yanıt / The Answer is $\frac{9}{10}$

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17. $\frac{x+2}{3}-\frac{x}{6}=\frac{8}{9} \Rightarrow x=?$

Yanıt / The Answer is $\frac{4}{3}$

18. $\frac{2x-3}{3}+\frac{x+1}{4}=2 \Rightarrow x=?$

Yanıt / The Answer is 3

19. $\frac{5x+1}{2}+\frac{x}{3}+\frac{x+1}{4}=10 \Rightarrow x=?$

Yanıt / The Answer is 3

20. $\frac{x-1}{4}-\frac{x+2}{2}=\frac{2x-14}{8} \Rightarrow x=?$

Yanıt / The Answer is 1

21. $\frac{2x-3}{3}-\frac{x-2}{6}=\frac{3x-11}{12} \Rightarrow x=?$

Yanıt / The Answer is –1

22. $\frac{3(x-1)+6}{5}=9 \Rightarrow x=?$

Yanıt / The Answer is 14

23. $\frac{3}{x-3}=\frac{5}{2(x+2)} \Rightarrow x=?$

Yanıt / The Answer is –27

24. $5(a-3)-3(a-2)=\frac{3}{2} \Rightarrow a=?$

Yanıt / The Answer is $\frac{21}{4}$

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25. $\frac{a-1}{2}-\frac{2a+3}{5}=-1 \Rightarrow$ **a = ?**

Yanıt / The Answer is 1

26. $\frac{a}{3}-\frac{a-3}{2}=\frac{2(a-1)}{3} \Rightarrow$ **a = ?**

Yanıt / The Answer is $\frac{13}{5}$

27. $\frac{3m+1}{2}-\frac{m}{3}=m-2 \Rightarrow$ **m = ?**

Yanıt / The Answer is –15

28. $\frac{m}{2}+\frac{m}{3}-\frac{m}{4}=21 \Rightarrow$ **m = ?**

Yanıt / The Answer is 36

29. $\frac{3(3x-2)}{2}-\frac{2(x-3)}{3}=45 \Rightarrow$ **x = ?**

Yanıt / The Answer is 12

30. $2x-\frac{2(x-1)}{3}=\frac{2(x+5)}{3} \Rightarrow$ **x = ?**

Yanıt / The Answer is 4

31. $\frac{2(x+2)}{3}-\frac{x-2}{2}=2 \Rightarrow$ **x = ?**

Yanıt / The Answer is –2

32. $\frac{3}{1-x}=\frac{3}{2(2-3x)} \Rightarrow$ **x = ?**

Yanıt / The Answer is $\frac{3}{5}$

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33. $\frac{3(x-8)}{4}-\frac{x-2}{2}=8 \Rightarrow x=?$

Yanıt / The Answer is 52

34. $\frac{-(x+6)}{3}+\frac{x-1}{6}=\frac{7}{3} \Rightarrow x=?$

Yanıt / The Answer is –27

35. $\frac{x}{2}-\left(1-\frac{x-2}{2}\right)=\frac{1}{2} \Rightarrow x=?$

Yanıt / The Answer is $\frac{5}{2}$

36. $\frac{x-2}{3}-\frac{x+1}{4}=\frac{1}{2} \Rightarrow x=?$

Yanıt / The Answer is 17

37. $\frac{2x-3}{4}-\frac{3x-1}{2}=\frac{7}{8} \Rightarrow x=?$

Yanıt / The Answer is $-\frac{9}{8}$

38. $\frac{3x}{2}-\frac{x-2}{3}+\frac{x}{2}=\frac{1}{2} \Rightarrow x=?$

Yanıt / The Answer is $-\frac{1}{10}$

39. $\frac{x-3}{3}+\frac{x-1}{2}=\frac{3}{4} \Rightarrow x=?$

Yanıt / The Answer is $\frac{27}{10}$

40. $\frac{x-5}{2}-\frac{x-4}{3}=\frac{-(x+3)}{6} \Rightarrow x=?$

Yanıt / The Answer is 2

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41. $\frac{2x+3}{3}-\frac{3x-10}{4}=\frac{11}{12} \Rightarrow$ **x = ?**

Yanıt / The Answer is 31

42. $\frac{2(x-2)-1}{3}-\frac{x-3}{4}=\frac{x+5}{24} \Rightarrow$ **x = ?**

Yanıt / The Answer is 3

43. $\frac{4x+7}{2x+1}=0,\overline{9} \Rightarrow$ **x = ?**

Yanıt / The Answer is –3

44. $\frac{1}{x}+\frac{1}{3x}+\frac{1}{4x}=1\frac{7}{12} \Rightarrow$ **x = ?**

Yanıt / The Answer is 1

45. $\dfrac{\dfrac{1}{1+\frac{1}{2}}}{1+\frac{1}{x}}=1 \Rightarrow$ **x = ?**

Yanıt / The Answer is –3

46. $1+\dfrac{3}{2+\frac{1}{1-x}}=3 \Rightarrow$ **x = ?**

Yanıt / The Answer is 3

47. $0,75x-3,59=0,25x+0,41 \Rightarrow$ **x = ?**

Yanıt / The Answer is 8

48. $x \neq 0, \quad \dfrac{\frac{1}{x}+1}{\frac{1}{x}-1}=4 \Rightarrow$ **x = ?**

Yanıt / The Answer is $\frac{3}{5}$

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49. $\dfrac{\sqrt{10}}{\sqrt{2}-\dfrac{x}{\sqrt{3}}}=\sqrt{5} \Rightarrow$ **x = ?**

Yanıt / The Answer is 0

50. $\dfrac{x-1}{3}+x=\dfrac{x}{-1} \Rightarrow$ **x = ?**

Yanıt / The Answer is $\frac{1}{7}$

51. $9 \cdot x = 0{,}99 \Rightarrow$ **$0{,}99 \cdot x$ = ?**

Yanıt / The Answer is 0,1089

52. $0,\overline{36}=\dfrac{x}{x+7} \Rightarrow$ **x = ?**

Yanıt / The Answer is 4

53. $0{,}5+\dfrac{-1}{3x-1}=0{,}3 \Rightarrow$ **x = ?**

Yanıt / The Answer is 2

54. $\dfrac{x}{0{,}5}-\dfrac{x}{0{,}4}-\dfrac{x}{0{,}2}=1 \Rightarrow$ **x = ?**

Yanıt / The Answer is $\frac{-2}{11}$

55. $2+\dfrac{4}{2+\dfrac{1}{3-x}}=6 \Rightarrow$ **x = ?**

Yanıt / The Answer is 4

56. $\dfrac{x-1}{1+\dfrac{1}{2}}=\dfrac{x}{3} \Rightarrow$ **x = ?**

Yanıt / The Answer is 2

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57. $\dfrac{0,\overline{x}}{1-\dfrac{10}{11}} : \dfrac{2}{9} = 44 \Rightarrow$ **x = ?**

Yanıt / **The Answer is 8**

58. $0,\overline{x} - \dfrac{0,\overline{x}}{0,\overline{xx}} = -\dfrac{2}{3} \Rightarrow$ **x = ?**

Yanıt / **The Answer is 3**

59. $\dfrac{\sqrt{60}}{\sqrt{5}-\dfrac{x}{\sqrt{2}-1}} = \sqrt{12} \Rightarrow$ **x = ?**

Yanıt / **The Answer is 0**

60. $\dfrac{0,\overline{3}+x}{0,\overline{5}} = \dfrac{8}{10} \Rightarrow$ **x = ?**

Yanıt / **The Answer is $\frac{1}{9}$**

61. $\left.\begin{array}{l} x-2y=6 \\ -x+y=4 \end{array}\right\} \Rightarrow$ **x + y = ?**

Yanıt / **The Answer is –24**

62. $\left.\begin{array}{l} 3x+y=10 \\ 2x-2y=12 \end{array}\right\} \Rightarrow$ **y = ?**

Yanıt / **The Answer is –2**

63. $\left.\begin{array}{l} a-2b=0 \\ 3b+2a=14 \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / **The Answer is {(4,2)}**

64. $\left.\begin{array}{l} 3a-4b=5 \\ 2a+3b=9 \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / **The Answer is {(3,1)}**

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65. $\left.\begin{aligned} 4x - y &= 12 \\ 3x + 2y &= 9 \end{aligned}\right\} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {(3,0)}

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66. $\left.\begin{aligned} \frac{4}{x} + \frac{5}{y} &= 2 \\ \frac{10}{y} - \frac{3}{x} &= 3 \end{aligned}\right\} \Rightarrow$ **x = ?**

Yanıt / The Answer is 11

---

67. $x = 2,\ y = -1,$ $\left.\begin{aligned} ax - by &= 1 \\ 2bx - 2ay &= 19 \end{aligned}\right\} \Rightarrow$ **a = ?**

Yanıt / The Answer is $-\frac{5}{2}$

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68. $\left.\begin{aligned} \frac{x - 2y}{2} &= 3 \\ \frac{x + y}{6} &= \frac{1}{2} \end{aligned}\right\} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {(4,–1)}

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69. $\left.\begin{aligned} \frac{5}{x} + \frac{12}{y} &= 2 \\ \frac{56}{y} - \frac{20}{x} &= 5 \end{aligned}\right\} \Rightarrow$ **y = ?**

Yanıt / The Answer is 8

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70. $\left.\begin{aligned} \frac{3}{x} - \frac{4}{y} &= \frac{1}{6} \\ \frac{2}{x} + \frac{3}{y} &= \frac{7}{12} \end{aligned}\right\} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {(6,12)}

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71. $\left.\begin{aligned} 3ax - 4by &= 10, \\ -7ax + 8by &= -24, \\ ÇK(SS) &= \{(1, -1)\} \end{aligned}\right\} \Rightarrow$ **a = ?**

Yanıt / The Answer is 4

---

72. $\left.\begin{aligned} 3x + 2y &= -1 \\ x - 4y &= 3 \end{aligned}\right\} \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\left\{\left(\frac{1}{7}, \frac{-5}{7}\right)\right\}$

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73. $\left.\begin{aligned} a^2 - b^2 &= 7 \\ a - b &= 1 \end{aligned}\right\} \Rightarrow$ **a = ?**

Yanıt / **The Answer is 4**

74. $\left.\begin{aligned} x + y &= 3 \\ y + z &= 4 \\ z + x &= 5 \end{aligned}\right\} \Rightarrow$ **x + y + z = ?**

Yanıt / **The Answer is 6**

75. $\left.\begin{aligned} 2x + y &= 17 \\ 2y + z &= 4 \\ 2z + x &= 12 \end{aligned}\right\} \Rightarrow$ **x + y + z = ?**

Yanıt / **The Answer is 11**

76. $\left.\begin{aligned} 11x + 8y + 2z &= 56 \\ 5x + z + 4y &= 27 \end{aligned}\right\} \Rightarrow$ **x = ?**

Yanıt / **The Answer is 2**

77. $\left.\begin{aligned} x + y &= 11 \\ z - y &= 4 \\ x - z &= 3 \end{aligned}\right\} \Rightarrow$ **y = ?**

Yanıt / **The Answer is 2**

78. $\left.\begin{aligned} a^2 &= b - c \\ b^2 &= a + c \\ c^2 &= b - a \end{aligned}\right\} \Rightarrow$ $\mathbf{a^2 + b^2 + c^2 = ?}$

Yanıt / **The Answer is 2b**

79. $\left.\begin{aligned} x + y &= 32 \\ x + z &= 14 \\ y + z &= 6 \end{aligned}\right\} \Rightarrow$ **z = ?**

Yanıt / **The Answer is 2**

80. $\left.\begin{aligned} 6x + 4y - 10z &= -5 \\ -4x - 2y + 12z &= 19 \end{aligned}\right\} \Rightarrow$ **x + y + z = ?**

Yanıt / **The Answer is 7**

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1. $-3x + 12 = 6 \Rightarrow$ **x = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

2. $2x + 1 = x + 6 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $4x - 11 = 2x + 4 \Rightarrow$ **x = ?**

A) $\frac{15}{2}$ B) 7 C) $\frac{13}{2}$ D) 6 E) $\frac{11}{2}$

4. $3x - 2 = 5x + 4 \Rightarrow$ **x = ?**

A) 1 B) 0 C) –1 D) –2 E) –3

5. $2(x + 3) - 2 = 3x + 1 \Rightarrow$ **ÇK(SS) = ?**

A) {1} B) {3} C) {4} D) {5} E) {7}

6. $4(x - 2) + 2x = 2(x + 6) - 13 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{7}{4}\right\}$ B) $\left\{\frac{7}{3}\right\}$ C) $\left\{\frac{7}{2}\right\}$ D) {7} E) {5}

7. $2x + 3(x + 2) = 6(x - 4) - 3x \Rightarrow$ **x = ?**

A) –9 B) –11 C) –13 D) –15 E) –17

8. $4x + \frac{1}{3}(2x - 4) = 8 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $\frac{x-4}{3}+\frac{x-2}{2}=\frac{2x-4}{4} \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

10. $\frac{2x+3}{5}-\frac{x-1}{2}=\frac{12}{5} \Rightarrow$ **x = ?**

A) –15 B) –13 C) –11 D) –9 E) –7

11. $\frac{2x}{x+2}=0,1\overline{6} \Rightarrow$ **x = ?**

A) $\frac{1}{11}$ B) $\frac{2}{11}$ C) $\frac{3}{11}$ D) $\frac{4}{11}$ E) $\frac{5}{11}$

12. $3+\frac{4}{2+\frac{1}{x}}=4 \Rightarrow$ **x = ?**

A) 1 B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) $\frac{1}{4}$ E) $\frac{1}{5}$

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13. $\frac{x}{x+2}-\frac{2}{1+\frac{3}{x-1}}=1 \Rightarrow$ **ÇK(SS) = ?**

A) {4} B) {3} C) {2} D) {0} E) {–3}

14. $\frac{1}{x-2}+\frac{4}{x+1}+\frac{x-3}{x-2}=\frac{4}{5} \Rightarrow$ **ÇK(SS) = ?**

A) {–3} B) {–7} C) {–9} D) {–17} E) {–21}

15. $\frac{2}{x}+\frac{x}{x-2}-\frac{x+2}{x}=\frac{2}{5} \Rightarrow$ **ÇK(SS) = ?**

A) {5} B) {7} C) {9} D) {11} E) {13}

16. $\frac{1}{1+\frac{1}{1+x}}=\frac{4}{5} \Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	E	A	E	B	A	D	B
9	10	11	12	13	14	15	16
D	B	B	B	D	E	B	B

1. $\frac{3}{5} + 2x = 2\frac{3}{5} \Rightarrow$ **x = ?**

A) $\frac{1}{5}$ B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) $\frac{3}{5}$

2. $2x(x-2) - x(2x-1) - x + 1 = 13$

$\Rightarrow$ **x = ?**

A) –3 B) –2 C) 1 D) 2 E) 3

3. $x - (1 - 2x) - x - 2 = -(-3x - 2)$

$\Rightarrow$ **x = ?**

A) –6 B) –5 C) 0 D) 2 E) 4

4. $3x + 5[2 - (3 + x)] = 9 \Rightarrow$ **x = ?**

A) –10 B) –8 C) –7 D) 7 E) 10

5. $a(5 - x) = 2ax + 3$,

$x = 2 \Rightarrow$ **a = ?**

A) –5 B) –3 C) 3 D) 4 E) 5

6. $x \in R^-$,

$2 - \{-2[x - (2x - 3)] + 4\} = 2(5 - x) + 3x$

$\Rightarrow$ **x = ?**

A) –10 B) –8 C) –7 D) –6 E) –2

7. $m \neq n$,

$2m + n(x - 3) = 2n + m(x - 3)$

$\Rightarrow$ **x = ?**

A) –5 B) –3 C) 1 D) 3 E) 5

8. $m \neq 1$,

$m(x + 5) = x + 5$

$\Rightarrow$ **x = ?**

A) –7 B) –5 C) –3 D) 3 E) 5

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9. $\frac{x+1}{3}-\frac{3x-1}{5}=x-2 \Rightarrow$ **x = ?**

A) –3 B) –2 C) 1 D) 2 E) 3

10. $\frac{3x-1}{2}-\frac{2x-5}{3}=2 \Rightarrow$ **x = ?**

A) –4 B) –1 C) 0 D) 1 E) 4

11. $\frac{1-2x}{4}-\frac{x-2}{2}=3 \Rightarrow$ **x = ?**

A) $-\frac{7}{4}$ B) $-\frac{5}{4}$ C) $\frac{1}{4}$ D) $\frac{5}{4}$ E) $\frac{7}{4}$

12. $\frac{3x-1}{2}=2-\frac{2x+3}{2}+\frac{x+3}{6} \Rightarrow$ **x = ?**

A) $\frac{7}{12}$ B) $\frac{5}{12}$ C) $\frac{9}{14}$ D) $\frac{5}{14}$ E) $\frac{7}{14}$

13. $\frac{5}{2}-\frac{x-1}{3}-\frac{x-2}{4}+x=5 \Rightarrow$ **x = ?**

A) $\frac{5}{12}$ B) $\frac{11}{12}$ C) 1 D) 3 E) 4

14. $\frac{2x+5}{3}-\frac{3x+1}{2}+3=0 \Rightarrow$ **x = ?**

A) $\frac{5}{6}$ B) $\frac{7}{6}$ C) 3 D) 5 E) 7

15. $\frac{3x-10}{2}-\frac{3-5x}{3}=\frac{1}{3} \Rightarrow$ **x = ?**

A) $-\frac{5}{6}$ B) $-\frac{1}{6}$ C) 0 D) 1 E) 2

16. $\frac{4x-3}{3}-\frac{x+1}{2}=\frac{2x-1}{5}-\frac{x-3}{6} \Rightarrow$ **x = ?**

A) $\frac{2}{15}$ B) $\frac{5}{12}$ C) $\frac{7}{15}$ D) 1 E) 3

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1	2	3	4	5	6	7	8
C	A	B	C	B	E	E	B
9	10	11	12	13	14	15	16
D	D	A	C	E	D	E	E

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1. $2(x-1)+x+6=25 \Rightarrow$ **ÇK(SS) = ?**

A) {4} B) {5} C) {6} D) {7} E) {8}

2. $\frac{x-1}{3}+\frac{x+1}{2}=6 \Rightarrow$ **ÇK(SS) = ?**

A) {5} B) {6} C) {7} D) {8} E) {9}

3. $\frac{3}{x}+8=\frac{2}{x}+10 \Rightarrow$ **x = ?**

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 3

4. $\frac{5}{2x-4}-\frac{2}{x+1}=0 \Rightarrow$ **x = ?**

A) −10 B) −11 C) −12 D) −13 E) −14

5. $\frac{x-1}{2}+\frac{2x-1}{3}+\frac{3x}{4}=2x+1 \Rightarrow$ **x = ?**

A) −20 B) −21 C) −22 D) −23 E) −24

6. $-2(1-x)+3(x-2)-(2x+1)=3 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

7. $\frac{x^2-8}{x-3}+\frac{1}{3-x}=0 \Rightarrow$ **ÇK(SS) = ?**

A) {−3, 3} B) {0} C) {−3} D) {3} E) ∅

8. $x \neq 2$
$(2x-4)\cdot 2=(x-2)\cdot 4 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $\dfrac{4}{x-1}+\dfrac{6}{x+2}+\dfrac{3+x}{1-x}=3 \Rightarrow$ **x = ?**

A) $-\frac{1}{4}$ B) $-\frac{1}{2}$ C) 0 D) $\frac{1}{2}$ E) $\frac{1}{4}$

10. $\dfrac{x^2-x-12}{x+3}=0 \Rightarrow$ **ÇK(SS) = ?**

A) {1} B) {–3, 4} C) {–3} D) R E) {4}

11. $\dfrac{x}{2}+\dfrac{x}{3}+\dfrac{x}{4}-\dfrac{5x}{12}=\dfrac{4}{3} \Rightarrow$ **ÇK(SS) = ?**

A) {1} B) {2} C){3} D) {4} E) {5}

12. $3x + 3(1 - x) = 3 \Rightarrow$ **ÇK(SS) = ?**

A) {0} B) {–1, 0} C) ∅ D) R E) {3}

13. $\dfrac{3x}{x-1}+\dfrac{2x+1}{1-x}-1=1 \Rightarrow$ **ÇK(SS) = ?**

A) {0} B) {–1, 1} C) ∅ D) R E) {1}

14. $a(x - 2) + 2(x + b) = 0$,

ÇK(SS) = R $\Rightarrow$ **a + b = ?**

A) –4 B) –2 C) 0 D) 2 E) 4

15. ÇK(SS) = R,

$\dfrac{ax-1}{3}-\dfrac{4x-b}{4}=\dfrac{5}{6} \Rightarrow$ **a + b = ?**

A) $\frac{20}{3}$ B) 7 C) $\frac{22}{3}$ D) $\frac{23}{3}$ E) 8

16. $\dfrac{2+\frac{1}{x}}{2-\frac{1}{x}}=-3 \Rightarrow$ **x = ?**

A) $\frac{1}{6}$ B) $\frac{1}{4}$ C) $\frac{1}{2}$ D) 1 E) 2

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1	2	3	4	5	6	7	8
D	C	B	D	C	D	C	E
9	10	11	12	13	14	15	16
B	E	B	D	C	A	D	B

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1. $\frac{3x}{2}+3=\frac{2x}{3}-2 \Rightarrow \mathbf{x=?}$

A) –6 B) –3 C) –2 D) 2 E) 6

2. $\frac{x}{3}-2=\frac{x+2}{6}+1 \Rightarrow \mathbf{x=?}$

A) –20 B) –10 C) 5 D) 10 E) 20

3. $\frac{x-2}{3}-\frac{x-1}{5}=2-\frac{2x-3}{15} \Rightarrow \mathbf{x=?}$

A) 3 B) 5 C) 8 D) 10 E) 12

4. $\frac{1}{x-a}+\frac{1}{x-3}+\frac{1}{x-2}=1,$
$ÇK(SS)=5 \Rightarrow \mathbf{a=?}$

A) –3 B) –1 C) 1 D) 4 E) 5

5. $\frac{1+\frac{x}{2}}{1-\frac{x}{2}}-\frac{5}{x-2}=8 \Rightarrow \mathbf{x=?}$

A) –6 B) –1 C) 1 D) 3 E) 4

6. $\frac{x}{3}-\frac{x-\frac{1}{3}}{2}+1=x \Rightarrow \mathbf{x=?}$

A) –3 B) –2 C) 1 D) 2 E) 3

7. $\frac{-3x+2}{4}-\frac{x-3}{8}=7 \Rightarrow \mathbf{x=?}$

A) –7 B) –5 C) –3 D) 5 E) 7

8. $5x-\frac{4}{3}(5x-4)=9 \Rightarrow \mathbf{x=?}$

A) $-\frac{11}{5}$ B) $-\frac{9}{5}$ C) $-\frac{11}{3}$ D) –3 E) –1

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9. $\frac{2x-3}{2}-\frac{x+1}{4}=\frac{1}{8} \Rightarrow$ **x = ?**

A) $\frac{5}{4}$ B) $\frac{3}{4}$ C) $\frac{1}{2}$ D) $\frac{3}{2}$ E) $\frac{5}{2}$

10. $3(x+1)-2(2x-1)=3-3x \Rightarrow$ **x = ?**

A) –3 B) –2 C) –1 D) 1 E) 2

11. $-2(1-x)+2-x-(2-x)=24 \Rightarrow$ **x = ?**

A) 7 B) 9 C) 11 D) 13 E) 15

12. $\frac{1-\frac{3}{2}}{1+\frac{1}{2}}-\frac{x}{x-\frac{1}{2}}=-1 \Rightarrow$ **x = ?**

A) –5 B) –4 C) –3 D) –1 E) 3

13. $\frac{0,5 \cdot x-0,5}{0,1}+\frac{0,2 \cdot x}{0,01}=5 \Rightarrow$ **x = ?**

A) 0,1 B) 0,2 C) 0,3 D) 0,4 E) 0,5

14. $\frac{1}{x-3}+\frac{1}{x-4}=\frac{1}{x-a}+1,$

$ÇK(SS)=\{6\} \Rightarrow$ **a = ?**

A) 4 B) 7 C) 10 D) 12 E) 15

15. $\frac{2-2(x-3)}{-x+4}+x=4 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

16. $x>0,$

$\frac{\frac{1}{x}+4+4x}{\frac{1}{2x}+1}=4 \Rightarrow$ **x = ?**

A) $\frac{1}{4}$ B) $\frac{2}{3}$ C) $\frac{1}{2}$ D) $\frac{3}{2}$ E) $\frac{5}{4}$

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1	2	3	4	5	6	7	8
A	E	D	B	C	C	A	A
9	10	11	12	13	14	15	16
E	C	D	D	D	D	B	C

1. $3(2x-1)-4(x+3)=13 \Rightarrow$ **ÇK(SS) = ?**

A) {7} B) {12} C) {13} D) {14} E) {16}

2. $\frac{x+2}{4}-\frac{x-3}{3}=5 \Rightarrow$ **ÇK(SS) = ?**

A) {–42} B) {–38} C) {–28} D) {28} E) {38}

3. $2(3x-7)=3(2x+4)-26 \Rightarrow$ **ÇK(SS) = ?**

A) ∅ B) R C) {0} D) {4} E) {17}

4. $4(2x+3)+x=3(3x-2)+5 \Rightarrow$ **ÇK(SS) = ?**

A) {13} B) {10} C) {0} D) R E) ∅

5. $\frac{x-2}{2}-\frac{x+5}{3}+\frac{2x-4}{4}=x-1 \Rightarrow$ **x = ?**

A) –8 B) –6 C) 1 D) 6 E) 8

6. $\frac{3}{2x+1}-\frac{4}{3x-5}=0 \Rightarrow$ **x = ?**

A) 15 B) 16 C) 17 D) 18 E) 19

7. $\frac{2}{x}+7=\frac{1}{x}-1 \Rightarrow$ **x = ?**

A) $-\frac{1}{8}$ B) $-\frac{1}{4}$ C) $-\frac{1}{2}$ D) $\frac{1}{4}$ E) $\frac{1}{8}$

8. $\frac{2-3x}{6}-\frac{x-3}{3}=-7 \Rightarrow$ **x = ?**

A) –15 B) –10 C) 5 D) 10 E) 15

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9. $\frac{x^2-1}{x-2}+\frac{3}{2-x}=0 \Rightarrow$ **ÇK(SS) = ?**

A) {−2} B) {2} C) {0} D) {−2, 2} E) ∅

10. $\frac{2}{x}+\frac{4}{x-2}-\frac{x+2}{x}=3 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

11. $\frac{3}{2x-3}=\frac{1}{x-2} \Rightarrow$ **ÇK(SS) = ?**

A) {3} B) {2} C) {1} D) {−2} E) {−3}

12. m(x − 1) + 3(x + 2n) + 15 = 0

ÇK(SS) = R $\Rightarrow$ **m + n = ?**

A) −6 B) −1 C) 0 D) 1 E) 6

13. $m \neq n$,

$\frac{x+m}{n}+\frac{x-n}{m}=0 \Rightarrow$ **x = ?**

A) n B) m C) m − n D) n − m E) m·n

14. $\frac{x^2-2x-15}{x+3}=0 \Rightarrow$ **ÇK(SS) = ?**

A) {3} B) {5} C) {3, 5} D) {−3} E) {−5}

15. $\frac{3}{x-2}-\frac{1}{x+1}=\frac{9}{x^2-x-2} \Rightarrow$ **ÇK(SS) = ?**

A) ∅ B) {−1} C) {2} D) {3} E) {4}

16. $\left.\begin{array}{l} x+2y+3z=3 \\ 3x+2y+z=13 \\ x-y-z=6 \end{array}\right\} \Rightarrow$ **x = ?**

A) 0 B) 1 C) 4 D) 5 E) 10

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1	2	3	4	5	6	7	8
D	A	B	E	A	E	A	D
9	10	11	12	13	14	15	16
A	C	C	A	D	B	A	D

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1. $\frac{3x-2}{3}+\frac{5-4x}{6}=1 \Rightarrow$ **x = ?**

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

2. $\frac{18}{4+\frac{8}{1+x}}=3 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $\frac{1+\frac{x+1}{4}}{3}+3=6 \Rightarrow$ **x = ?**

A) 30 B) 31 C) 32 D) 33 E) 34

4. $\frac{x^2}{1-2x}+1=x-1 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{2}{3},1\right\}$ B) $\left\{-1,\frac{1}{3}\right\}$ C) {–1, 1} D) $\left\{\frac{4}{3},1\right\}$ E) ∅

5. $\left.\begin{array}{l} x-2y=-11 \\ x+y=7 \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

A) {(–1, 1)} B) {(1, 2)} C) {(1, 3)} D) {(2, 5)} E) {(1, 6)}

6. $\left.\begin{array}{l} -2x+y=14 \\ x+2y=8 \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

A) {(–4, 6)} B) {(–3, 5)} C) {(–1, 1)} D) {(–5, 7)} E) {(–4, 0)}

7. $\left.\begin{array}{l} \frac{1}{2}x-2y=-4 \\ 2x+3y=6 \end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

A) {(–2, 0)} B) {(0, 2)} C) {(–2, 2)} D) {(–3, 0)} E) {(–1, 1)}

8. $\left.\begin{array}{l} \frac{3}{4}x+\frac{1}{2}y=\frac{13}{4} \\ \frac{5}{4}x+\frac{3}{2}y=\frac{1}{4} \end{array}\right\} \Rightarrow$ **x + y = ?**

A) 7 B) $\frac{7}{2}$ C) $\frac{7}{4}$ D) $\frac{7}{6}$ E) $\frac{7}{8}$

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9. $\left.\begin{array}{l}5x-3y=6\\-10x+6y=-12\end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

A) {(1, 2)} B) {(–1, 2)} C) {(–2, 2)} D) ∅ E) R

10. (a –1)x + by = 4,
(a + 1)x + (b – 1)y = 8
ÇK(SS) = R ⇒ **a + b = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

11. $\left.\begin{array}{l}6x+5y=8\\18x+15y=26\end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

A) {(–2, 2)} B) {(2, –2)} C) {(0, 2)} D) ∅ E) R

12. ax + by – y = 12,
3ax + by = 8,
ÇK(SS) = ∅ ⇒ **b = ?**

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

13. $\left.\begin{array}{l}(a+2)x-3y=9\\(a-1)x+6y=12\\ÇK(SS)=\varnothing\end{array}\right\} \Rightarrow$ **a = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

14. $\left.\begin{array}{l}\frac{1}{x}-\frac{2}{y}=\frac{7}{3}\\\frac{3}{x}-\frac{1}{y}=-\frac{1}{2}\end{array}\right\} \Rightarrow$ **x = ?**

A) –2 B) $-\frac{3}{2}$ C) –1 D) 1 E) 2

15. $\left.\begin{array}{l}\frac{2}{x}+\frac{3}{y}=\frac{13}{2}\\\frac{3}{x}-\frac{1}{y}=\frac{3}{2}\end{array}\right\} \Rightarrow$ **ÇK(SS) = ?**

A) {(1, –1)} B) $\left\{\left(1,\frac{1}{3}\right)\right\}$ C) $\left\{\left(1,\frac{2}{3}\right)\right\}$ D) $\left\{\left(-1,-\frac{1}{3}\right)\right\}$ E) $\left\{\left(-\frac{2}{3},1\right)\right\}$

16. $\left.\begin{array}{l}a+b=5\\2b-c=5\\c-a=2\end{array}\right\} \Rightarrow$ **a·b·c = ?**

A) 12 B) 14 C) 15 D) 18 E) 24

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1	2	3	4	5	6	7	8
E	C	B	A	E	A	B	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
E	B	D	C	B	B	C	A

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1. $\dfrac{4x}{0,4}+\dfrac{5x}{0,5}=\dfrac{x}{0,1}+10 \Rightarrow$ **x = ?**

A) $\frac{1}{10}$ B) $\frac{1}{5}$ C) $\frac{1}{2}$ D) 1 E) 0

2. $\dfrac{4-x}{3}-\dfrac{x-5}{4}=\dfrac{5}{6} \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $a \in R$,

$\dfrac{x-3}{2}+\dfrac{x-5}{3}-\dfrac{x-a}{5}=\dfrac{1}{3}$, ÇK(SS) = 3 $\Rightarrow$ **a = ?**

A) 8 B) 7 C) 6 D) 5 E) 4

4. $5-[-3-(1-x)]=x-[2x-(3x+3)] \Rightarrow$ **ÇK(SS) = ?**

A) {1} B) {2} C) {3} D) {4} E) ∅

5. $4+\dfrac{12}{2-\dfrac{3}{x-1}}=8 \Rightarrow$ **x = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

6. $\dfrac{0,17}{x}=\dfrac{0,51}{0,3} \Rightarrow$ **x = ?**

A) –0,1 B) –0,2 C) –1 D) 0,1 E) 10

7. $\dfrac{2x+1}{3x-2}-\dfrac{x+1}{2-3x}=0 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{-\frac{2}{3}\right\}$ B) $\left\{-\frac{1}{3}\right\}$ C) $\{0\}$ D) $\left\{\frac{3}{2}\right\}$ E) $\{6\}$

8. $\left.\begin{array}{l} a+b+c=2 \\ 2a=3b \\ \dfrac{a+c}{6}=1 \end{array}\right\} \Rightarrow$ **c = ?**

A) –12 B) –8 C) 8 D) 12 E) 14

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9. $\left.\begin{aligned} 2x+3y&=10 \\ 3x+2y&=4 \end{aligned}\right\} \Rightarrow \mathbf{x^2-y^2=?}$

A) $-\frac{84}{5}$ B) –12 C) –8 D) –6 E) $-\frac{8}{5}$

10. $\left.\begin{aligned} \frac{2}{2a-b+3}&=1 \\ \frac{1}{2+b-2a+x}&=\frac{1}{2} \end{aligned}\right\} \Rightarrow \mathbf{x=?}$

A) 2 B) 1 C) –1 D) –2 E) –3

11. $\left.\begin{aligned} x+y&=10 \\ y+z&=24 \\ x+z&=16 \end{aligned}\right\} \Rightarrow \mathbf{x=?}$

A) 1 B) 2 C) 7 D) 8 E) 9

12. $\left.\begin{aligned} x+y-z&=27 \\ x-y+z&=9 \end{aligned}\right\} \Rightarrow \mathbf{2x+4y-4z=?}$

A) 18 B) 36 C) 72 D) 82 E) 92

13. $(x-3)^2+(3y+15)^2=0 \Rightarrow \mathbf{x-y=?}$

A) 1 B) 2 C) 4 D) 8 E) 16

14. $\frac{3}{3-a}+\frac{3a-6}{a^2-5a+6}=0 \Rightarrow \mathbf{ÇK(SS)=?}$

A) ∅ B) {3} C) {0} D) R E) R – {2, 3}

15. $\left(\frac{a-3}{\frac{a}{4}}+2\right)\cdot x-2=2,\ \text{ÇK(SS)}=\{1\} \Rightarrow \mathbf{a=?}$

A) 6 B) 4 C) 2 D) –2 E) –4

16. $\left.\begin{aligned} 2a+b-c&=-7 \\ a+b-2c&=-6 \\ 3a-2b+c&=-9 \end{aligned}\right\} \Rightarrow \mathbf{a=?}$

A) –3 B) –2 C) 1 D) 2 E) 3

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1	2	3	4	5	6	7	8
D	C	A	B	A	D	A	D
9	10	11	12	13	14	15	16
A	C	A	C	D	E	A	A

1. $\frac{x-3}{2}-\frac{x-1}{3}=\frac{2x+7}{6} \Rightarrow x=?$

A) –18 B) –14 C) –8 D) –7 E) –3

2. $x^2+\frac{1}{3-x}=9-\frac{1}{x-3} \Rightarrow$ ÇK(SS) = ?

A) {–3} B) {3} C) {–3, 3} D) ∅ E) R

3. $\frac{3x-1}{6}-\frac{2x+1}{8}=\frac{3-x}{12} \Rightarrow x=?$

A) $\frac{9}{8}$ B) $\frac{11}{8}$ C) $\frac{13}{8}$ D) $\frac{15}{8}$ E) $\frac{17}{8}$

4. $\dfrac{6}{1-\dfrac{5}{1-\dfrac{2}{x+1}}}=3 \Rightarrow x=?$

A) $-\frac{4}{3}$ B) $-\frac{2}{3}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$ E) $\frac{4}{3}$

5. $\dfrac{6}{2+\dfrac{3}{1+\dfrac{x}{2}}}=2 \Rightarrow x=?$

A) 1 B) 2 C) 3 D) 4 E) 5

6. $\dfrac{\dfrac{\frac{x}{2}-1}{2}+1}{3}+2=4 \Rightarrow x=?$

A) 18 B) 20 C) 22 D) 24 E) 26

7. $\left.\begin{array}{l}x-3y=4\\2x+y=8\end{array}\right\} \Rightarrow$ ÇK(SS) = ?

A) {(4, 0)} B) {(0, 4)} C) {(3, 1)} D) {(1, 3)} E) {4}

8. $\left.\begin{array}{l}2x-3y=9\\x+2y=1\end{array}\right\} \Rightarrow$ ÇK(SS) = ?

A) {(1, 3)} B) {(–2, 3)} C) {(–1, 3)} D) {(3, 0)} E) {(3, –1)}

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9. $\left.\begin{array}{l}2x-3y=8\\3x+4y=12\end{array}\right\} \Rightarrow \mathbf{x \cdot y = ?}$

A) –2 B) –1 C) 0 D) 2 E) 4

10. $\left.\begin{array}{l}3x-2y=4\\-6x+4y=12\end{array}\right\} \Rightarrow \mathbf{ÇK(SS) = ?}$

A) {(0, 0)} B) {(1, 2)} C) {(1, 1)} D) ∅ E) R

11. $\left.\begin{array}{l}4x+2y=3\\8x+4y=6\end{array}\right\} \Rightarrow \mathbf{ÇK(SS) = ?}$

A) ∅ B) R C) {(0, 0)} D) {(–1, –1)} E) {(1, 1)}

12. $(m-2)x+4y=2$,
$6x-(n+1)y=3$,
ÇK(SS) = R $\Rightarrow$ **m + n =?**

A) –2 B) –1 C) 0 D) 1 E) 2

13. $\left.\begin{array}{l}(m+1)x-3y=4\\(3-2m)x+5y=12\\ÇK(SS)=\varnothing\end{array}\right\} \Rightarrow \mathbf{m = ?}$

A) 3 B) 6 C) 7 D) 10 E) 14

14. $\left.\begin{array}{l}\frac{x-1}{4}+\frac{y}{2}=2\\\frac{x}{3}-\frac{y-1}{2}=\frac{7}{6}\end{array}\right\} \Rightarrow \mathbf{x = ?}$

A) 4 B) 5 C) 6 D) 7 E) 8

15. $\left.\begin{array}{l}\frac{1}{x}+\frac{1}{y}=3\\\frac{3}{x}-\frac{2}{y}=4\end{array}\right\} \Rightarrow \mathbf{x = ?}$

A) $-\frac{1}{2}$ B) $-\frac{1}{3}$ C) $\frac{1}{2}$ D) $\frac{1}{3}$ E) $\frac{1}{4}$

16. $\left.\begin{array}{l}\frac{2}{x}-\frac{3}{y}=-4\\\frac{-5}{x}+\frac{2}{y}=\frac{9}{2}\end{array}\right\} \Rightarrow \mathbf{x \cdot y = ?}$

A) –9 B) –5 C) –2 D) 4 E) 6

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1	2	3	4	5	6	7	8
B	A	C	B	D	C	A	E
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	D	B	B	E	B	C	C

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1. $a(x-2) = 4(x-a) + 5$,
$ÇK(SS) = \varnothing \Rightarrow$ **a = ?**

A) 1 B) 2 C) 4 D) 6 E) 12

2. $\left.\begin{matrix} 7x+9y+5z=44 \\ x+3y-z=-22 \end{matrix}\right\} \Rightarrow$ **x + y + z = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

3. $x, y \in Z^+$, $x \neq y \neq z$,
$x + y + z = 11$,
$x + y - z = 3 \Rightarrow \sum x = ?$

A) 14 B) 16 C) 17 D) 21 E) 23

4. $\left.\begin{matrix} 3x+y+3z=17 \\ x-y+z=5 \end{matrix}\right\} \Rightarrow$ **x + y + z = ?**

A) 12 B) 11 C) 6 D) 5 E) 4

5. $\left.\begin{matrix} 3a+2b-c=6 \\ a-5b-2c=10 \\ 4a+11b+11c=8 \end{matrix}\right\} \Rightarrow$ **a + b + c = ?**

A) 4 B) 3 C) 2 D) –2 E) –3

6. $\dfrac{1}{x^2-y^2} = \dfrac{1}{x-y} = \dfrac{1}{6} \Rightarrow$ **x = ?**

A) 5 B) $\frac{9}{2}$ C) 4 D) $\frac{7}{2}$ E) $\frac{5}{2}$

7. $\left.\begin{matrix} x-\dfrac{3}{y}=4 \\ y-\dfrac{3}{x}=6 \end{matrix}\right\} \Rightarrow \dfrac{x}{y} = ?$

A) 3 B) 2 C) $\frac{3}{2}$ D) $\frac{2}{3}$ E) $\frac{1}{2}$

8. $\left.\begin{matrix} (m-1)x+(n+3)y+6=0 \\ 2x+3y-3=0 \\ ÇK(SS)=R \end{matrix}\right\} \Rightarrow \dfrac{m}{n} = ?$

A) 2 B) 3 C) $\frac{1}{3}$ D) $-\frac{1}{3}$ E) –3

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9. $\left.\begin{array}{l} 3x-2y=15 \\ -x-3z=1 \\ 2y+z=6 \end{array}\right\} \Rightarrow \mathbf{x+z=?}$

A) 4 B) 5 C) 6 D) 8 E) 10

10. $\left.\begin{array}{l} 3x-y-2z=14 \\ x-2y+z=8 \end{array}\right\} \Rightarrow \mathbf{x-y=?}$

A) 2 B) 4 C) 6 D) 8 E) 10

11. $\left.\begin{array}{l} x\cdot y=\frac{1}{2} \\ y\cdot z=\frac{1}{3} \\ x\cdot y\cdot z=2 \end{array}\right\} \Rightarrow \mathbf{x\cdot z=?}$

A) 4 B) 6 C) 8 D) 12 E) 24

12. $\left.\begin{array}{l} 3a-b+c=8 \\ a-2b-c=-6 \\ a+2b+c=4 \end{array}\right\} \Rightarrow \mathbf{a+b+c=?}$

A) 6 B) 5 C) 1 D) –5 E) –6

13. $\left.\begin{array}{l} -x-2y+3z=-2 \\ -3x+2y+z=8 \end{array}\right\} \Rightarrow \mathbf{x-2y+z=?}$

A) 5 B) 4 C) –3 D) –4 E) –5

14. a, b, c ∈ Z,

$\left.\begin{array}{l} a+b=6 \\ a+c=5 \\ 3b+c=3 \end{array}\right\} \Rightarrow \mathbf{2a+3b-c=?}$

A) 5 B) 7 C) 13 D) 15 E) 17

15. $\left.\begin{array}{l} \frac{3a}{2}-\frac{2b}{3}=\frac{1}{6} \\ \frac{2a}{3}-\frac{3b}{2}=-\frac{7}{3} \end{array}\right\} \Rightarrow \mathbf{b\cdot a=?}$

A) 4 B) 2 C) 1 D) –1 E) –2

16. $\left.\begin{array}{l} \frac{3}{x}+\frac{2}{y}=2 \\ \frac{1}{x}-\frac{1}{y}=4 \end{array}\right\} \Rightarrow \mathbf{x=?}$

A) 2 B) $\frac{3}{2}$ C) 1 D) $\frac{1}{2}$ E) $-\frac{1}{4}$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	B	A	C	B	D	D	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	C	E	A	E	C	B	D

1. $\frac{2-x}{4}+\frac{3x-1}{2}=\frac{x+1}{6}+2 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

2. $\frac{x+1}{x-1}-\frac{1}{2x-2}=1 \Rightarrow$ **ÇK(SS) = ?**

A) {–2} B) {–1} C) {0} D) ∅ E) R

3. $x - y = 8 \Rightarrow$ **2x + 4(2y – x) – 3[y – (2x – 3y)] = ?**

A) 16 B) 24 C) 32 D) 40 E) 48

4. $m \neq 3$,
$4x - m = mx - 3 + x \Rightarrow$ **x = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

5. $\dfrac{12}{3+\dfrac{11}{1-\dfrac{1}{x}}}=3 \Rightarrow$ **x = ?**

A) $-\frac{1}{2}$ B) $-\frac{1}{4}$ C) $-\frac{1}{6}$ D) $-\frac{1}{8}$ E) $-\frac{1}{10}$

6. $\dfrac{3}{1-\dfrac{2}{a-1}}=1 \Rightarrow$ **a = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

7. $\left.\begin{array}{l} mx-3y+6=0 \\ 4x+y+n=0 \\ ÇK(SS)=R \end{array}\right\} \Rightarrow$ **m + n = ?**

A) –18 B) –14 C) –12 D) –8 E) –6

8. $x = 24 + z + y$,
$3x + y + z = 0 \Rightarrow$ **x = ?**

A) 4 B) 6 C) 8 D) 10 E) 12

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9. $3mx - 6m = 4 - 9x$,

$ÇK(SS) = \varnothing \Rightarrow$ **m = ?**

A) –3 B) –2 C) $\frac{2}{3}$ D) $\frac{3}{2}$ E) 3

10. $\left.\begin{array}{l} x \cdot y = \frac{5}{4} \\ x - y = 5 \end{array}\right\} \Rightarrow \frac{x}{y} + \frac{y}{x} = ?$

A) $\frac{5}{11}$ B) $\frac{38}{11}$ C) 9 D) 19 E) 22

11. $\left.\begin{array}{l} x - y = 6 \\ z - m = 8 \end{array}\right\} \Rightarrow (x+z)-(y+m) = ?$

A) 12 B) 14 C) 16 D) 24 E) 36

12. $\left.\begin{array}{l} x^2 = 3y - 16 \\ y^2 = 3x - 16 \\ x - y = 7 \end{array}\right\} \Rightarrow x \cdot y = ?$

A) –10 B) –8 C) – 6 D) 6 E) 10

13. $\frac{x+1}{x-2} + \frac{x+1}{x+2} + \frac{2x-3}{x+1} = \frac{3-2x}{x-1} \Rightarrow$ **x = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

14. $a = 2, \quad b = 5$

$\left.\begin{array}{r} ax + by = 3 \\ -by + ax = 5 \end{array}\right\} \Rightarrow ÇK(SS) = ?$

A) $\left\{\left(4, -\frac{1}{2}\right)\right\}$ B) $\left\{\left(2, -\frac{1}{5}\right)\right\}$ C) $\{(4,3)\}$

D) $\{(2,3)\}$ E) $\left\{\left(2, -\frac{1}{2}\right)\right\}$

15. $\frac{3-x}{2} + 3 = \frac{x-3}{2} \Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 6 E) 9

16. $2a + 3 = \frac{a-5x}{x+2}$, $ÇK(SS) = \varnothing \Rightarrow$ **a = ?**

A) –4 B) –2 C) 0 D) 2 E) 4

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	D	C	B	B	A	B	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
A	E	B	A	B	E	D	A

1. $\left.\begin{array}{l} x+my=3 \\ x-y=3 \\ ÇK(SS)=R \end{array}\right\} \Rightarrow m=?$

A) –3 B) –2 C) –1 D) 1 E) 3

2. $a \neq 2$

$\left.\begin{array}{l} (a-1)x-y=1 \\ ax-2y=a \end{array}\right\} \Rightarrow x=?$

A) –3 B) –1 C) 0 D) 1 E) 3

3. $\left.\begin{array}{l} (a+c)x-by=b\cdot c \\ x+y=a+b \end{array}\right\} \Rightarrow (x,y)=?$

A) (-a, b) B) (-b, a) C) (a, b) D) (b, a) E) (3, a)

4. $\left.\begin{array}{l} 2x+1=3y \\ x-y=2 \end{array}\right\} \Rightarrow x+y=?$

A) 6 B) 8 C) 9 D) 10 E) 12

5. $\dfrac{6}{1-\dfrac{1}{2+\dfrac{a+5}{2}}}=3 \Rightarrow a=?$

A) –4 B) –6 C) –8 D) –10 E) –11

6. $\dfrac{5}{3+\dfrac{2}{1+\dfrac{x+1}{5}}}=1 \Rightarrow x=?$

A) –3 B) –1 C) 1 D) 2 E) 3

7. $x<0,$

$\dfrac{x}{1+\dfrac{1}{x}}-\dfrac{1-2x}{1+x}=2 \Rightarrow x=?$

A) $-\sqrt{5}$ B) –2 C) $-\sqrt{3}$ D) $-\sqrt{2}$ E) –1

8. $2-\dfrac{2-\dfrac{2-\dfrac{x}{3}}{3}}{3}=2 \Rightarrow x=?$

A) –12 B) –6 C) –4 D) 4 E) 6

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9. $\frac{x+2}{x-2}-\frac{1}{x}=\frac{2}{x^2-2x} \Rightarrow$ **ÇK(SS) = ?**

A) {–3} B) {–1} C) {1} D) {3} E) {5}

10. $3-\frac{15}{2-\frac{x}{3x-1}}=3 \Rightarrow$ **ÇK(SS) = ?**

A) ∅ B) {1} C) {2} D) {3} E) R

11. $\frac{x+3}{x^2-1}-\frac{1}{x-1}-\frac{2}{x^2-1}=0 \Rightarrow$ **ÇK(SS) = ?**

A) ∅ B) {–1} C) {1} D) {–1,1} E) R–{–1,1}

12. $(x-y+1)^4+(x+y+3)^8=0 \Rightarrow$ **x·y = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

13. $4x^2-12x+9+(2x+3y)^2=0 \Rightarrow$ **y = ?**

A) –3 B) –1 C) 0 D) 1 E) 3

14. $a \neq b$,

$\frac{ax+2b}{b}-\frac{bx+2a}{a}=\frac{1}{a}-\frac{1}{b} \Rightarrow$ **x = ?**

A) $\frac{-2}{a+b}$ B) $\frac{-1}{a+b}$ C) $\frac{-2}{a-b}$ D) $\frac{-1}{a-b}$ E) $\frac{-1}{b-a}$

15. $\frac{1}{a}-\frac{2}{x}=\frac{1}{x}-\frac{1}{b} \Rightarrow$ **x = ?**

A) $\frac{ab}{a+b}$ B) $\frac{2ab}{a+b}$ C) $\frac{3ab}{a+b}$ D) $\frac{a+b}{ab}$ E) $\frac{a+b}{2ab}$

16. $\left.\begin{array}{l}\frac{a+b}{2}+a=10\\ \frac{a-b}{2}+b=3\end{array}\right\} \Rightarrow$ **b = ?**

A) –5 B) –3 C) –1 D) 3 E) 5

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	B	D	E	E	B	C	A
9	10	11	12	13	14	15	16
B	A	E	B	B	B	C	C

1. $\left.\begin{array}{l} x-y=2 \\ x+3y=10 \end{array}\right\} \Rightarrow$ **y = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

2. $\left.\begin{array}{l} 2x+y=6 \\ x-3y=3 \end{array}\right\} \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $\frac{x}{2}+\frac{2y}{3}=3$

$x-4y=10 \Rightarrow$ **y = ?**

A) $\frac{-1}{2}$ B) $\frac{-3}{4}$ C) $\frac{-5}{6}$ D) $\frac{1}{2}$ E) $\frac{3}{4}$

4. $\left.\begin{array}{l} x+ny=3 \\ nx-my=-1 \end{array}\right\}, (x,y)=(2,-1) \Rightarrow$ **m · n = ?**

A) –4 B) –3 C) –2 D) –1 E) 0

5. $\left.\begin{array}{l} -3x+2y=0 \\ 2x+y=7 \end{array}\right\} \Rightarrow$ **x + y = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

6. $\left.\begin{array}{l} \frac{3}{x}-\frac{5}{y}=\frac{20}{6} \\ \frac{2}{x}+\frac{1}{y}=\frac{5}{12} \end{array}\right\} \Rightarrow$ **x + y = ?**

A) –2 B) 0 C) 1 D) 2 E) 3

7. $\left.\begin{array}{l} 3x+2ay=-5 \\ ax+6y=4 \\ ÇK(SS)=\varnothing \end{array}\right\} \Rightarrow$ **a = ?**

A) –7 B) –6 C) –5 D) –4 E) –3

8. $\frac{x}{a}+\frac{y}{b}=2,$

$bx-ay=0 \Rightarrow$ **x = ?**

A) a·b B) $\frac{a}{2}$ C) $\frac{b}{2}$ D) a E) b

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9. $\left.\begin{array}{l}\dfrac{2}{x}-\dfrac{3}{y}=13\\ \dfrac{5}{x}+\dfrac{2}{y}=4\end{array}\right\} \Rightarrow \mathbf{x \cdot y = ?}$

A) $\frac{-5}{6}$ B) $\frac{-1}{6}$ C) $\frac{1}{6}$ D) $\frac{2}{3}$ E) $\frac{5}{6}$

10. $\left.\begin{array}{l}\dfrac{1}{x}+\dfrac{1}{y}=5\\ \dfrac{3}{y}+\dfrac{2}{x}=7\end{array}\right\} \Rightarrow \mathbf{y = ?}$

A) $\frac{-2}{3}$ B) $\frac{-1}{3}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$ E) $\frac{4}{3}$

11. $\left.\begin{array}{l}x+3y=11\\ x-y+\dfrac{1}{x+3y}=\dfrac{56}{11}\end{array}\right\} \Rightarrow \mathbf{x+y = ?}$

A) 10 B) 9 C) 8 D) 7 E) 6

12. $x^2-y^2=12,$

$\dfrac{1}{x-y}+\dfrac{1}{x+y}=x+5 \Rightarrow \mathbf{x = ?}$

A) –12 B) –9 C) –8 D) –6 E) –5

13. $\left.\begin{array}{l}x+z=4\\ y+z=5\\ x-y=2z\end{array}\right\} \Rightarrow \mathbf{x = ?}$

A) $\frac{11}{2}$ B) $\frac{9}{2}$ C) $\frac{7}{2}$ D) $\frac{5}{2}$ E) $\frac{3}{2}$

14. $\left.\begin{array}{l}a+b=4\\ b+c=8\\ a+c=6\end{array}\right\} \Rightarrow \mathbf{b = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

15. $\left.\begin{array}{l}a+2b+c=8\\ a-2b+c=0\end{array}\right\} \Rightarrow \mathbf{a+b+c = ?}$

A) 5 B) 6 C) 7 D) 8 E) 9

16. $\left.\begin{array}{l}2a+b=c\\ a+c=3b\\ a+b+c=12\end{array}\right\} \Rightarrow \mathbf{c = ?}$

A) 3 B) 5 C) 7 D) 9 E) 11

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	C	B	D	A	B	E	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	B	C	D	B	C	B	C

1. $3\cdot(x+2)-2x=x+12 \Rightarrow$ **ÇK(SS) = ?**

A) {2} B) {4} C) {6} D) ∅ E) R

[ANKARA ÜNİVERSİTESİ – YÖS 2018]

2. $\left.\begin{array}{l}\frac{1}{x}+\frac{2}{y}=3\\ \frac{6}{y}-\frac{2}{x}=2\end{array}\right\} \Rightarrow$ **y = ?**

A) $\frac{4}{5}$ B) $\frac{5}{4}$ C) 1 D) $\frac{5}{2}$ E) 2

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

3. $\left.\begin{array}{l}a+2b-2c=6\\ 3a-2b-2c=2\end{array}\right\} \Rightarrow$ **c − a = ?**

A) –2 B) –1 C) 0 D) 2 E) 3

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

4. $3+\dfrac{10}{2+\dfrac{6}{5-x}}=9 \Rightarrow$ **x = ?**

A) 22 B) 23 C) 24 D) 25 E) 26

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

5. $\frac{1}{x-5}+\frac{1}{3-2y}=0 \Rightarrow$ **x − 2y = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2017]

6. $\left.\begin{array}{l}2a+b-c=-7\\ a+b-2c=-6\\ 3a-2b+c=-9\end{array}\right\} \Rightarrow$ **a = ?**

A) –3 B) –2 C) 1 D) 2 E) 3

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

7.

x	y
–	47
5	

$x+y=965 \Rightarrow$ **y = ?**

A) 18 B) 19 C) 20 D) 21 E) 22

[ERCİYES ÜNİVERSİTESİ – YÖS 2017]

8. $\left.\begin{array}{l}\frac{3}{x}+\frac{2}{y}=2\\ \frac{1}{x}-\frac{1}{y}=4\end{array}\right\} \Rightarrow$ **x = ?**

A) 2 B) $\frac{3}{2}$ C) 1 D) $\frac{1}{2}$ E) $-\frac{1}{4}$

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $\left.\begin{aligned} x+2y+3z&=3 \\ 3x+2y+z&=13 \\ x-y-z&=6 \end{aligned}\right\} \Rightarrow \mathbf{x = ?}$

A) 0 B) 1 C) 4 D) 5 E) 10

[SELÇUK ÜNİVERSİTESİ – YÖS 2018]

10. $\left.\begin{aligned} x+2y&=7 \\ 2x-2y&=5 \end{aligned}\right\} \Rightarrow \mathbf{x \cdot y = ?}$

A) 1 B) 2 C) 3 D) 5 E) 6

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

11. $x \neq -2, \quad x \neq -\frac{2}{3}$

$3-\dfrac{2}{2+\dfrac{4x}{x+2}}=1 \Rightarrow \mathbf{x = ?}$

A) 2 B) −1 C) $-\frac{2}{5}$ D) $-\frac{1}{5}$ E) 0

[BALIKESİR ÜNİVERSİTESİ – YÖS 2017]

12. $\dfrac{\frac{1}{x}}{1-\frac{3}{x}}=\dfrac{2}{3} \Rightarrow \mathbf{x = ?}$

A) $\frac{7}{3}$ B) $\frac{9}{2}$ C) $\frac{3}{8}$ D) $\frac{4}{5}$ E) $\frac{2}{7}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

13. $\left.\begin{aligned} b-a&=4 \\ y+x+b&=51 \\ c+y&=51 \\ a+x+23&=51 \end{aligned}\right\} \Rightarrow \mathbf{c = ?}$

A) 14 B) 17 C) 25 D) 32 E) 35

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

14. $\left.\begin{aligned} \frac{4}{x}+\frac{6}{y}&=0 \\ \frac{3}{x}-\frac{4}{y}&=-17 \end{aligned}\right\} \Rightarrow \mathbf{x \cdot y = ?}$

A) $\frac{17}{3}$ B) $\frac{9}{2}$ C) $-\frac{1}{6}$ D) −18 E) $\frac{1}{7}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

15. $\left.\begin{aligned} 3x-7y&=7 \\ 2y-x&=-4 \end{aligned}\right\} \Rightarrow \mathbf{x+y = ?}$

A) 10 B) 11 C) 13 D) 17 E) 19

[İSTANBUL ÜNİVERSİTESİ – YÖS 2016]

16. $\left.\begin{aligned} a+b+c&=7 \\ 2a+c-b&=4 \\ 3a-2b+c&=3 \end{aligned}\right\} \Rightarrow \mathbf{\frac{c-a}{b+1} = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	B	D	B	B	A	C	D
9	10	11	12	13	14	15	16
D	E	C	B	D	C	E	A

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BÖLÜM CHAPTER 8

TARİHSEL NOT / HISTORICAL NOTE

Aristarchus of Samos [about 270 BC]

Yunan gökbilimci. Dünya'nın Güneş etrafındaki dönüşünü açıklayan ilk astronomlardan biridir. Güneş ve Ay'ın Dünya'ya olan uzaklıklarını bulmak için geometrik yöntemleri kullanmıştır.

Greek astronomer, noted for being the first to affirm that the Earth rotates and travels around the Sun. He treated astronomy mathematically and used geometrical methods to calculate the relative sizes of the Sun and Moon and their relative distances from the Earth.

1. DERECEDEN EŞİTSİZLİKLER
1st ORDER INEQUALITIES

Bu bölüm 32 alıştırma sorusu, 112 test sorusu, 16 YÖS sorusu içermektedir.

This chapter includes 32 exercise questions, 112 test questions and 16 YÖS questions.

BÖLÜM / CHAPTER 8

BİRİNCİ DERECEDEN EŞİTSİZLİKLER / FIRST ORDER INEQUALITIES

- Birinci Dereceden Eşitsizlikler / First Order Inequalities . . . . 379 - 400

BÖLÜM 08 CHAPTER

BİRİNCİ DERECEDEN EŞİTSİZLİKLER
FIRST ORDER INEQUALITIES

Alıştırmalar / Exercises

1. $x \in Z, \quad 7 < x$

$\Rightarrow$ **$\min(x^2 + 5x) = ?$**

Yanıt / The Answer is 104

2. $x, y \in Z, \quad x < 7$

$x + y = 23 \quad \Rightarrow$ **$\min(y) = ?$**

Yanıt / The Answer is 17

3. $a \in Z, \quad -5 < a < 8$

$\Rightarrow$ **$\sum a = ?$**

Yanıt / The Answer is 18

4. $a, b \in Z,$

$\left.\begin{matrix} 3 < a < 10 \\ 5 < b < 15 \end{matrix}\right\} \Rightarrow$ **$\max(a + b) = ?$**

Yanıt / The Answer is 23

5. $x, y \in Z,$

$\left.\begin{matrix} -4 < x < 8 \\ 3 \le y < 10 \end{matrix}\right\} \Rightarrow$ **$\max(y - x) = ?$**

Yanıt / The Answer is 12

6. $x, y \in Z,$

$\left.\begin{matrix} -3 < x \le 7 \\ -4 \le y < 5 \end{matrix}\right\} \Rightarrow$ **$\min(x + y) = ?$**

Yanıt / The Answer is –6

7. $x, y \in Z, \quad 15 < x$

$2x + y = 55 \quad \Rightarrow$ **$\max(y) = ?$**

Yanıt / The Answer is 23

8. $a, b \in Z, \quad a < b$

$a \cdot b = 14 \quad \Rightarrow$ **$\sum a = ?$**

Yanıt / The Answer is –18

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9. $a, k \in Z, \quad a = 3k$

$-7 < a \leq 21 \quad \Rightarrow \quad \sum a = ?$

Yanıt / The Answer is 75

10. $x \in N^+$,

$x - 2 \leq 7 \quad \Rightarrow \quad \sum x = ?$

Yanıt / The Answer is 45

11. $x \in Z$

$-12 \leq x - 3 < 10 \quad \Rightarrow \quad \sum x = ?$

Yanıt / The Answer is 33

12. $3x - 5 < 16 \quad \Rightarrow \quad$ **ÇK(SS) = ?**

Yanıt / The Answer is $x < 7$

13. $2x + 3 > x + 15 \quad \Rightarrow \quad$ **ÇK(SS) = ?**

Yanıt / The Answer is $12 < x$

14. $3(x - 2) - (4 - x) < 5 - x \quad \Rightarrow \quad$ **ÇK(SS) = ?**

Yanıt / The Answer is $x < 3$

15. $\frac{4x - 5}{3} < 5 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $x < 5$

16. $-4 \leq \frac{x}{5} < 3 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $-20 \leq x < 15$

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17. $\frac{6x-2}{3} \geq \frac{2x-7}{2} \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $-\frac{17}{6} \leq x$

18. $-\frac{5}{2} < \frac{3x+2}{4} \leq \frac{1}{8} \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $-4 < x \leq -\frac{1}{2}$

19. $6 - 3\cdot(2x-1) < 3x + 5 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\frac{4}{9} < x$

20. $\frac{x+4}{-3} \leq -7 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $17 \leq x$

21. $\frac{5-3x}{-4} > 6 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\frac{29}{3} < x$

22. $\frac{3-x}{2} + \frac{2-x}{3} \leq 1 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\frac{7}{5} \leq x$

23. $\frac{-x}{4} - \frac{x-2}{3} \leq -5 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $\frac{68}{7} \leq x$

24. $-2 < \frac{3-x}{4} - x \leq 5 \Rightarrow$ ÇK(SS) = ?

Yanıt / The Answer is $-\frac{17}{5} \leq x < \frac{11}{5}$

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25. $a, b \in R, \quad x < 2a + 3b < y$

$\left.\begin{array}{l} 4 < a < 11 \\ -2 < b < 8 \end{array}\right\} \Rightarrow \mathbf{x + y = ?}$

Yanıt / The Answer is 48

26. $m, n \in Z, \quad (3m - 2n) \in Z$

$\left.\begin{array}{l} -5 \le m < 13 \\ -3 < n < 8 \end{array}\right\} \Rightarrow \mathbf{\min(3m - 2n) = ?}$

Yanıt / The Answer is –29

27. $x, y \in Z, \quad (4x - y) \in Z$

$\left.\begin{array}{l} 4 < x < 11 \\ -3 < y < 8 \end{array}\right\} \Rightarrow \mathbf{\max(4x - y) = ?}$

Yanıt / The Answer is 42

28. $x, y \in Z, \quad (3x^2 - 2y) \in Z$

$\left.\begin{array}{l} -7 < x < 5 \\ -5 < y < 7 \end{array}\right\} \Rightarrow \mathbf{\max(3x^2 - 2y) = ?}$

Yanıt / The Answer is 116

29. $x, y \in R, \quad (2x^2 + y) \in Z$

$\left.\begin{array}{l} -4 \le x < 3 \\ -5 < y \le -1 \end{array}\right\} \Rightarrow \mathbf{\max(2x^2 + y) = ?}$

Yanıt / The Answer is 31

30. $x \in R, \quad (4x + 1) \in Z$

$x^2 < x \quad \Rightarrow \quad \mathbf{\sum(4x + 1) = ?}$

Yanıt / The Answer is 9

31. $x, y \in R, \quad x^2 < x$

$y - x = 3 \quad \Rightarrow \quad \mathbf{? < y < ?}$

Yanıt / The Answer is 3 < y < 4

32. $x \in R, \quad x^2 < x, \quad y \in Z$

$y - 5x = 3 \quad \Rightarrow \quad \mathbf{\sum y = ?}$

Yanıt / The Answer is 22

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1. $x \in Z$,

$\frac{x}{3} - 2x + 15 < 5 \Rightarrow$ **min(x) = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

2. $x \in Z$,

$x + 4 \leq 3x - 2 < 13 \Rightarrow \sum x = ?$

A) 5 B) 7 C) 9 D) 12 E) 14

3. $\frac{4x-3}{3} + 2 \leq 2x - \frac{x+4}{4} - \frac{x}{6}$

$\Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty,6]$ B) $(-\infty,8]$ C) $[6,\infty)$ D) $[8,\infty)$ E) $[9,\infty)$

4. $x, y \in Z$

$\left.\begin{array}{l}-4 < x < 3\\ -5 < y < 7\end{array}\right\} \Rightarrow$ **max(3x – 2y) = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

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5. $x, y, z \in R$

$x^4y < 0$,

$yz < 0$,

$x \cdot z^3 > 0$

$\Rightarrow$ **x, y, z = ?, ?, ?**

A) +,–,+ B) –,–,+ C) –,+,+ D) +,+,+ E) +,–,–

6. $x, y \in Z$

$\left.\begin{array}{l}-2 \leq x < 4\\ -3 < y \leq 2\end{array}\right\} \Rightarrow$ **min(x² – 2y) = ?**

A) –5 B) –4 C) –3 D) –2 E) –1

7. $x, y \in R$,

$(3y - 2x) \in Z$,

$-3 < x < 4$,

$-2 < y < 3$

$\Rightarrow$ **min(3y – 2x) = ?**

A) –14 B) –13 C) –12 D) –11 E) –10

8. $(x^2 + y^2) \in Z$,

$-5 < x < 4$,

$-5 < y < -2$

$\Rightarrow$ **max(x² + y²) = ?**

A) 16 B) 25 C) 36 D) 40 E) 49

9. $x \in Z$,

$-1 \le \frac{5-3x}{4} < 3 \Rightarrow \sum x = ?$

A) 3 B) 7 C) 12 D) 18 E) 25

10. $\left.\begin{matrix} 2x-8<0 \\ 3x+9\ge 0 \end{matrix}\right\} \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty,4)$ B) $(-\infty,-3)$ C) $(-\infty,-3]$ D) $(-\infty,4]$ E) $[-3,4)$

11. $x-2 \le -3x+4 < x+4 \Rightarrow$ **ÇK(SS) = ?**

A) $\left(0,\frac{1}{2}\right)$ B) $\left(0,\frac{1}{2}\right]$ C) $\left(0,\frac{3}{2}\right)$ D) $\left(0,\frac{3}{2}\right]$ E) $\left(\frac{1}{2},\frac{3}{2}\right]$

12. $x, y \in Z$, $a \in Z$,

$\left.\begin{matrix} -9 \le x-y < 15 \\ \frac{y-x}{a} = 3 \end{matrix}\right\} \Rightarrow \sum a = ?$

A) –4 B) –3 C) 1 D) 4 E) 6

13. $\left.\begin{matrix} -1 < x-1 < 6 \\ 0 < x+2 \le 6 \end{matrix}\right\} \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty,0)$ B) $(-\infty,4)$ C) $(-\infty,4]$ D) $(-2,4]$ E) $(0,4]$

14. $\frac{5}{x-1} \ge \frac{1}{2} \Rightarrow$ **ÇK(SS) = ?**

A) $(0,5)$ B) $(1,5)$ C) $(1,5]$ D) $(-\infty,11]-\{1\}$ E) $[1,5]$

15. $x \in Z$,

$-15 < 2(x-1) < 6 \Rightarrow$ **max(x) + min(x) = ?**

A) –5 B) –3 C) 2 D) 5 E) 7

16. $5^{4-x} < 1 \le 7^{7-x}$

$x \in Z \Rightarrow \sum x = ?$

A) 16 B) 18 C) 20 D) 24 E) 28

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1	2	3	4	5	6	7	8
C	B	D	E	A	B	B	E
9	10	11	12	13	14	15	16
A	E	D	A	E	D	B	B

1. $x \in Z$,
$3x - 1 < 11 \Rightarrow$ **max(x) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

2. $x \in Z$,
$\frac{2x-1}{5} > 5 \Rightarrow$ **min(x) = ?**

A) 13 B) 14 C) 15 D) 16 E) 17

3. $x \in N$,
$\frac{3x-2}{2} < 5 \Rightarrow \sum x = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

4. $x, y \in Z$,
$\left.\begin{matrix} -4 \le x < 5 \\ 3 < y < 8 \end{matrix}\right\} \Rightarrow \max(x-2y)+\min(x+y) = ?$

A) –4 B) –2 C) 2 D) 4 E) 8

5. $x \in Z$, $y \in R$,
$\left.\begin{matrix} -1 < y \le 3 \\ x + 2y = 4 \end{matrix}\right\} \Rightarrow \sum x = ?$

A) 8 B) 10 C) 12 D) 14 E) 16

6. $x, y \in Z$,
$\left.\begin{matrix} 4 \le x \le 12 \\ -2 < -y < 6 \end{matrix}\right\} \Rightarrow \max(2x+y) = ?$

A) 26 B) 29 C) 23 D) 24 E) 25

7. $y \in Z$,
$x > x^2$
$3x - 2y = 6$
$\Rightarrow$ **y = ?**

A) –3 B) –2 C) –1 D) 0 E) 1

8. $4x - 8 \ge x + 4 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, -4)$ B) $(-\infty, -4]$ C) $(4, \infty)$ D) $[4, \infty)$ E) $[3, \infty)$

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9. $x \in Z$,

$-4 \le \frac{4x+4}{6} \le 8 \Rightarrow \sum x = ?$

A) 35 B) 36 C) 37 D) 38 E) 39

10. $x \in Z$,

$7 < 2x + 1 < 17 \Rightarrow \sum x = ?$

A) 20 B) 21 C) 22 D) 23 E) 24

11. $x \in Z$,

$\frac{1}{4} < \frac{2x-1}{12} < \frac{2}{3} \Rightarrow \sum x = ?$

A) 1 B) 3 C) 5 D) 7 E) 9

12. $x \in Z$,

$\frac{2}{7} < \frac{6}{x+2} < \frac{3}{5} \Rightarrow \max(x) - \min(x) = ?$

A) 5 B) 6 C) 7 D) 8 E) 9

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13. $x, y \in R$, $(2x - y) \in Z$,

$\left.\begin{array}{l} 3 \le x < 8 \\ -4 < y < 12 \end{array}\right\} \Rightarrow \max(2x - y) = ?$

A) 20 B) 19 C) 18 D) 17 E) 16

14. $x, y \in R$, $(2y - x) \in Z$,

$\left.\begin{array}{l} -8 \le x \le 10 \\ -6 \le y \le 12 \end{array}\right\} \Rightarrow \min(2y - x) = ?$

A) –18 B) –19 C) –20 D) –21 E) –22

15. $x \in Z$,

$3x - 6 < -x + 8 < x + 10$

$\Rightarrow \sum x = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

16. $(4x + 3) \in Z$

$x^2 < x \Rightarrow \max(4x + 3) = ?$

A) –4 B) –2 C) 2 D) 4 E) 6

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1	2	3	4	5	6	7	8
C	B	E	A	C	E	B	D
9	10	11	12	13	14	15	16
D	C	D	E	B	E	C	E

1. $\frac{x-1}{2}-2<1+\frac{x}{2} \Rightarrow$ **ÇK(SS) = ?**

A) {–1} B) {1} C) {0} D) ∅ E) R

2. $\frac{x}{3}-2>\frac{x+1}{3} \Rightarrow$ **ÇK(SS) = ?**

A) {–1} B) {–1, 1} C) {2} D) ∅ E) R

3. $a \in Z$,

$\left.\begin{matrix} a-3b=8 \\ -1<b<2 \end{matrix}\right\} \Rightarrow$ **max(a) = ?**

A) 11 B) 12 C) 13 D) 14 E) 15

4. $(x^2-2y) \in Z$,

$\left.\begin{matrix} -6<x\le 8 \\ -2\le y<4 \end{matrix}\right\} \Rightarrow$ **max(x² – 2y) = ?**

A) 63 B) 64 C) 65 D) 67 E) 68

5. $(a^2-b^2) \in Z$,

$\left.\begin{matrix} -4\le a\le 6 \\ -5\le b\le 8 \end{matrix}\right\} \Rightarrow$ **min(a² – b²) = ?**

A) –64 B) –36 C) –32 D) –24 E) 0

6. $(x \cdot y) \in Z$,

$\left.\begin{matrix} -10\le x<8 \\ -9<y\le -2 \end{matrix}\right\} \Rightarrow$ **max(x · y) = ?**

A) 90 B) 89 C) 88 D) 87 E) 86

7. $\left.\begin{matrix} 2\le a\le 12 \\ -2\le b\le 8 \end{matrix}\right\} \Rightarrow$ **? < a · b < ?**

A) $-2<a\cdot b<8$
B) $-4<a\cdot b<24$
C) $-24<a\cdot b<24$
D) $-24\le a\cdot b\le 96$
E) $-2<a\cdot b<77$

8. $x, y \in R$, $A \in Z$,

$-3\le x<3$, $-1<y\le 4$

$A=x^2-y \Rightarrow$ **$\sum A$ = ?**

A) 25 B) 28 C) 30 D) 33 E) 35

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9. $x \in Z$,

$\frac{4x+7}{6} < \frac{x-1}{3} \Rightarrow$ **max(x) = ?**

A) –5 B) –4 C) –3 D) –2 E) –1

10. $x \in Z$,

$3 < 2 - \frac{2-x}{2} < 5 \Rightarrow \sum x = ?$

A) 11 B) 14 C) 15 D) 18 E) 21

11. $x \in Z$,

$-3x + 4 < 3x - 2 < 2x + 8$

$\Rightarrow \sum x = ?$

A) 11 B) 22 C) 33 D) 44 E) 55

14. $a, b, c \in R$, $A \in Z$,

$4a + 3b - 2c < 4$,

$3a + 3b - 3c > 4$,

$a + c = A \Rightarrow$ **max(A) = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

13. $A = x^2 - 2x + 3$,

$-4 < x < 3 \Rightarrow$ **? < A < ?**

A) $2 \leq A < 27$ B) $2 < A < 27$ C) $3 \leq A \leq 27$ D) $3 < A < 27$ E) $4 \leq A < 27$

14. $a < b < 0 < c$

$\Rightarrow \frac{1}{?} < \frac{1}{?} < \frac{1}{?}$

A) $\frac{1}{a} < \frac{1}{b} < \frac{1}{c}$ B) $\frac{1}{b} < \frac{1}{a} < \frac{1}{c}$

C) $\frac{1}{c} < \frac{1}{a} < \frac{1}{b}$ D) $\frac{1}{a} < \frac{1}{c} < \frac{1}{b}$

E) $\frac{1}{c} < \frac{1}{b} < \frac{1}{a}$

15. $a > a^2$,

$x = \frac{1}{a}$, $y = \frac{1}{a^2}$, $z = \frac{1}{a^3} \Rightarrow$ **? > ? > ?**

A) x > y > z B) x > z > y

C) z > x > y D) y > z > x

E) z > y > x

16. $x \in Z$,

$\left(\frac{2}{3}\right)^{2x-3} < \left(\frac{2}{3}\right)^{3x+2} \Rightarrow$ **max(x) = ?**

A) –6 B) –5 C) –4 D) –3 E) –2

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1	2	3	4	5	6	7	8
E	D	C	E	A	B	D	E
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
A	D	D	B	A	B	E	A

1. $3(x-2)+2 \le 17 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, -7]$ B) $(-\infty, 7)$ C) $(-\infty, 7]$ D) $(-7, \infty)$ E) $(7, \infty)$

2. $x \in R^+$,
$4(x-2)+6 < 34 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, 9]$ B) $(9, \infty)$ C) $[0, 9)$ D) $(0, 9)$ E) $(0, 9]$

3. $x \in Z$,
$4(x-3) > 3x+5 \Rightarrow$ **min(x) = ?**

A) 17 B) 18 C) 19 D) 20 E) 21

4. $\frac{2x+1}{3} - \frac{x+2}{4} \ge 4 \Rightarrow$ **ÇK(SS) = ?**

A) $(10, \infty)$ B) $[-10, \infty)$ C) $(-\infty, 10]$ D) $[10, \infty)$ E) $(0, \infty)$

5. $(x+4)^2 \ge 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\varnothing$ B) $[-4, \infty)$ C) $(-4, \infty)$ D) $(4, \infty)$ E) R

6. $(x+4)^2 \le 0 \Rightarrow$ **ÇK(SS) = ?**

A) R B) $\{-4\}$ C) $(-2, \infty)$ D) $[-2, \infty)$ E) $(-\infty, -2]$

7. $x \in Z$,
$\frac{x}{x-3} > 1 \Rightarrow$ **min(x) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

8. $x \in Z$,
$3x-5 < x+5 < 2x+3 \Rightarrow \sum x = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

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9. $x \in Z$,

$2x + 3 < x + 12 < 3x + 2$

$\Rightarrow$ **max(x) + min(x) = ?**

A) 14 B) 13 C) 12 D) 11 E) 10

10. $\frac{x-3}{3} + \frac{x+2}{6} < \frac{2x+5}{2} \Rightarrow$ **ÇK(SS) = ?**

A) $\left(\frac{-19}{3}, \infty\right)$ B) $\left(\frac{-19}{3}, 0\right)$ C) $\left(-\infty, \frac{-19}{3}\right)$ D) $\left(\frac{19}{3}, \infty\right)$ E) $\left(-\infty, \frac{19}{3}\right)$

11. $x \in Z$,

$2 < \frac{3x+2}{4} < 8 \Rightarrow \sum x = ?$

A) 38 B) 40 C) 42 D) 44 E) 46

12. $a \in Z$,

$\left.\begin{array}{l} a+b > 5 \\ b+c < 3 \\ a+c > 2 \end{array}\right\} \Rightarrow \min(a) = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

13. $y \in Z$,

$2y = 2x + 3, \quad -2 < x < 3 \quad \Rightarrow \sum y = ?$

A) 8 B) 10 C) 11 D) 12 E) 13

14. $x + 3y = 15$,

$3 < y < 6$

$\Rightarrow$ **? < x < ?**

A) $-3 < x < 6$ B) $3 < x < 6$ C) $0 < x < 3$ D) $-3 < x < 3$ E) $-2 < x < 4$

15. $\left.\begin{array}{l} -3 < x < 7 \\ -5 < y < 10 \end{array}\right\} \Rightarrow ? < x \cdot y < ?$

A) $-15 < x \cdot y < 30$ B) $-30 < x \cdot y < 30$ C) $-30 < x \cdot y < 70$ D) $-35 < x \cdot y < 70$ E) $-35 < x \cdot y < 30$

16. $x, y \in Z$

$\left.\begin{array}{l} -3 \le x < 5 \\ -2 < y < 4 \end{array}\right\} \Rightarrow \min(2x - 3y) = ?$

A) –17 B) –15 C) –13 D) 13 E) 15

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1	2	3	4	5	6	7	8
C	D	B	D	E	B	C	D
9	10	11	12	13	14	15	16
A	A	C	C	B	A	D	B

1. $x \in Z$,
$\frac{3-2x}{5} < -3 \Rightarrow$ **min(x) = ?**

A) 8 B) 9 C) 10 D) 11 E) 12

2. $x \in N$,
$\frac{x}{3} - \frac{x}{2} > -1 \Rightarrow \sum x = ?$

A) 9 B) 10 C) 12 D) 15 E) 21

3. $x, y \in Z$,
$-3 < x < 7, \quad -2 < y \le 6$
$\Rightarrow$ **max(x − 2y) = ?**

A) 7 B) 8 C) 11 D) 12 E) 30

4. $x \in Z$,
$2 \le y < 4$
$2y - x = 6 \Rightarrow \sum x = ?$

A) −2 B) 0 C) 1 D) 2 E) 3

5. $2^x = 18, 3^y = 64, 5^z = 117$
$\Rightarrow$ **? < ? < ?**

A) x < y < z
B) x < z < y
C) z < y < x
D) z < x < y
E) y < z < x

6. $x, y, z \in R^-$,
$x \cdot y = \frac{3}{5}, \; y \cdot z = \frac{13}{15}, \; x \cdot z = \frac{7}{10}$
$\Rightarrow$ **? < ? < ?**

A) x < y < z
B) y < z < x
C) z < y < x
D) z < x < y
E) y < x < z

7. $y \in Z$,
$x \ge x^2, \quad 4x - y = 5 \Rightarrow \sum y = ?$

A) −15 B) −14 C) −13 D) −12 E) −11

8. $y \in Z$,
$x^2 < x, \quad 3x - y = 6 \Rightarrow \sum y = ?$

A) −10 B) −9 C) −7 D) −6 E) −5

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9. $3x - 5 > x + 17 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, 11)$ B) $(-\infty, 11]$ C) $(11, \infty)$ D) $[11, \infty)$ E) $(11, 17)$

10. $-3 \le \dfrac{2x-3}{5} \le 7 \Rightarrow$ **ÇK(SS) = ?**

A) $(-6, 19)$ B) $[-6, 19)$ C) $[-6, 19]$ D) $[-3, 7)$ E) $(-3, 5)$

11. $x \in Z$,
$5 < 3 - 2x \le 9 \Rightarrow \sum x = ?$

A) –2 B) –5 C) –6 D) –8 E) –10

12. $x, y \in Z$,
$-4 < x < 5, \quad -2 < y < 6,$
$x - 2y = A \Rightarrow$ **min(A) + max(A) = ?**

A) –6 B) –7 C) –8 D) –9 E) –10

13. $\dfrac{1}{6} < \dfrac{2}{x-3} < \dfrac{1}{3} \Rightarrow$ **ÇK(SS) = ?**

A) $(3, 5)$ B) $(3, 15)$ C) $(5, 6)$ D) $(6, 15)$ E) $(9, 15)$

14. $-\dfrac{1}{2} < \dfrac{3}{x+1} < -\dfrac{1}{8} \Rightarrow$ **ÇK(SS) = ?**

A) $-25 < x < -7$ B) $-23 < x < -6$
C) $-21 < x < -7$ D) $-21 < x < -5$
E) $-25 < x < -9$

15. $x \in Z$,
$-9 \le -2x + 5 < 7 \Rightarrow \sum x = ?$

A) 25 B) 26 C) 27 D) 28 E) 29

16. $x \in Z$,
$x - 5 < 2x + 3 \le x + 11 \Rightarrow \sum x = ?$

A) –8 B) –2 C) 0 D) 2 E) 8

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1	2	3	4	5	6	7	8
C	D	B	A	C	C	A	B
9	10	11	12	13	14	15	16
C	C	B	B	E	A	D	E

1. $x \in Z^+$,
$2(x-3) < x+4 \Rightarrow$ **max(x) + min(x) = ?**

A) 2 B) 3 C) 5 D) 10 E) 13

2. $x \in Z$,
$\frac{x+1}{4} - \frac{x-2}{2} < \frac{2x-3}{6} \Rightarrow$ **min(x) = ?**

A) 1 B) 3 C) 4 D) 6 E) 8

3. $3x + 1 \le x + 7 < 2x + 6 \Rightarrow$ **ÇK(SS) = ?**

A) (1, 3) B) (0, 4) C) [1, 4] D) [1, 3] E) (1, 3]

4. $\left.\begin{matrix}(x^2-3) \in Z \\ -3 < x < 4\end{matrix}\right\} \Rightarrow$ **max(x^2-3) = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

5. $(x^2 + y) \in Z$,
$-5 \le x < 3$, $-3 \le y < 5 \Rightarrow$ **max$(x^2 + y)$ + min$(x^2 + y)$ = ?**

A) 28 B) 27 C) 26 D) 25 E) 24

6. $x, y \in Z$,
$\left.\begin{matrix}-3 \le x < 4 \\ -1 \le y < 2\end{matrix}\right\} \Rightarrow$ **max(3x – 2y) = ?**

A) 9 B) 10 C) 11 D) 12 E) 13

7. $x, y \in R$, $(3x - 2y) \in Z$,
$\left.\begin{matrix}-3 \le x < 4 \\ -1 \le y < 2\end{matrix}\right\} \Rightarrow$ **max(3x – 2y) = ?**

A) 9 B) 10 C) 11 D) 12 E) 13

8. $x, y \in R$, $(3x + 2y) \in Z$,
$\left.\begin{matrix}2 < x < 5 \\ -4 < y < 3\end{matrix}\right\} \Rightarrow$ **min(2x + 3y) = ?**

A) –10 B) –7 C) –4 D) 2 E) 4

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9. $x, y \in Z$,
$\left.\begin{matrix} -4 < x \leq 3 \\ 0 \leq y < 5 \end{matrix}\right\} \Rightarrow$ **$\max(2x - y) = ?$**

A) 6 B) 8 C) 10 D) 12 E) 14

10. $x > 0$,
$\frac{3x-5}{x} > 2 \Rightarrow$ **$ÇK(SS) = ?$**

A) (0, 5) B) (5, ∞) C) [5, ∞) D) R^+ E) (0, 5]

11. $x, y, z \in R$,
$\left.\begin{matrix} x^2 \cdot y > 0 \\ y^2 \cdot z < 0 \\ 2x = 3z \end{matrix}\right\} \Rightarrow$ **? < ? < ?**

A) $y < z < x$ B) $y < x < z$ C) $x < z < y$ D) $x < y < z$ E) $z < y < x$

12. $a < 0 < c < b \Rightarrow$ **? < ? < ?**

A) $\frac{1}{a} > \frac{1}{c} > \frac{1}{b}$ B) $\frac{1}{b} > \frac{1}{c} > \frac{1}{a}$ C) $\frac{1}{a} > \frac{1}{b} > \frac{1}{c}$ D) $\frac{1}{c} > \frac{1}{b} > \frac{1}{a}$ E) $\frac{1}{c} > \frac{1}{a} > \frac{1}{b}$

13. $0 < x < y < 1 \Rightarrow$ **$? < \frac{y}{x} < ?$**

A) $0 < \frac{y}{x} < 1$ B) $1 < \frac{y}{x} < 2$ C) $0 < \frac{y}{x} < 2$ D) $0 < \frac{y}{x} < \infty$ E) $1 < \frac{y}{x} < \infty$

14. $\left.\begin{matrix} 1 \leq 2x + 1 \leq 5 \\ -2 \leq 3x - 5 \leq 4 \end{matrix}\right\} \Rightarrow$ **$\max(x) = ?$**

A) 0 B) 1 C) 2 D) 3 E) 4

15. $(x + y), (x - y) \in Z$,
$-5 < x + y < 3$,
$-4 < x - y < 2$
$\Rightarrow$ **$\max(x^2 - y^2) = ?$**

A) 12 B) 11 C) 10 D) 9 E) 8

16. $x + y - 5 = 0$
$2 < x < 4 \Rightarrow$ **$? < y < ?$**

A) $1 < y < 3$ B) $0 < y < 3$ C) $2 < y < 3$ D) $3 < y < 4$ E) $3 < y < 5$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	C	E	C	C	C	E	B
9	10	11	12	13	14	15	16
A	B	C	D	E	C	A	A

1. $x \in N$,

$3x + 7 < 2x + 1 \Rightarrow$ **ÇK(SS) = ?**

A) $(-\infty, 0)$ B) $(0, \infty)$ C) $[-6, \infty)$

D) $(-\infty, -6)$ E) $\varnothing$

2. $\frac{x}{2} - 3 < \frac{x+1}{2} \Rightarrow$ **ÇK(SS) = ?**

A) {0} B) {1} C) $\varnothing$

D) R E) R \ {0}

3. $x^2 < x$

$\left.\begin{array}{l} a = x^4 \\ b = x^{-2} \\ c = \frac{1}{x^3} \end{array}\right\} \Rightarrow$ **? > ? > ?**

A) a > b > c B) a > c > b

C) c > b > a D) b > c > a

E) c > a > b

4. $x^2 - 4x + 5 \in Z$,

$-2 < x \leq 4 \Rightarrow$ **$\max(x^2 - 4x + 5)$ = ?**

A) 20 B) 19 C) 18 D) 17 E) 16

5. $(2x - y) \in Z$,

$-3 \leq x < 0, \quad 0 \leq y < 3 \Rightarrow$ **$\sum(2x - y)$ = ?**

A) −35 B) −36 C) −37

D) −38 E) −39

6. $(a^2 - b^2) \in Z$,

$\left.\begin{array}{l} -1 < a < 1 \\ -2 < b \leq 2 \end{array}\right\} \Rightarrow$ **$\sum(a^2 - b^2)$ = ?**

A) −9 B) −10 C) −11

D) −12 E) −13

7. $(a \cdot b) \in Z$,

$\left.\begin{array}{l} -5 \leq a < 6 \\ -3 \leq b \leq 2 \end{array}\right\} \Rightarrow$ **$\max(a \cdot b)$ = ?**

A) −18 B) −10 C) 12 D) 15 E) 18

8. $b \in N$,

$\left.\begin{array}{l} a + b < 4 \\ b + c < 3 \\ a + c > 2 \end{array}\right\} \Rightarrow$ **$\sum(b)$ = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $a, b, c \in R, \quad x \in Z,$

$3a + 2b - c < 0,$

$-2a - b + c < 0,$

$a - c = x \Rightarrow$ **min(x) = ?**

A) –4 B) –3 C) 0 D) 1 E) 4

10. $x \in Z,$

$\frac{5x+3}{4} < \frac{x-1}{2} \Rightarrow$ **max(x) = ?**

A) –4 B) –3 C) –2 D) 1 E) 0

11. $x \in Z,$

$2 < 1 - \frac{x-1}{2} \leq 5 \Rightarrow \sum x = ?$

A) –28 B) –27 C) –24 D) –23 E) –21

12. $x \in Z,$

$-2x < 2x + 4 < 6 + x \Rightarrow \sum x = ?$

A) –4 B) –3 C) 0 D) 1 E) 3

13. $x, y \in R, \quad A \in Z,$

$-4 < x < 2, \quad -2 < y < 3,$

$A = 4x - 3y \Rightarrow$ **max(A) + min(A) = ?**

A) –7 B) –8 C) –11 D) –12 E) –13

14. $x, y \in R, \quad A \in Z,$

$-2 < x < 3, \quad -3 \leq y < 4$

$A = x^2 - 3y \Rightarrow \sum A = ?$

A) –42 B) –30 C) –21 D) 87 E) 96

15. $x \in Z$

$4 \leq x^2 \leq 16 \Rightarrow \sum x = ?$

A) 0 B) 2 C) 4 D) 6 E) 8

16. $\left.\begin{matrix} -2 < x < 5 \\ -8 < y < 3 \end{matrix}\right\} \Rightarrow\ ? < x \cdot y < ?$

A) $-40 < x \cdot y < 16$

B) $-18 < x \cdot y < 36$

C) $-6 < x \cdot y < 18$

D) $12 < x \cdot y < 18$

E) $12 < x \cdot y < 36$

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	D	C	E	B	B	D	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	C	B	D	C	D	A	A

1. $x, y \in Z$,

$$\left.\begin{array}{l} -2 \le x < 7 \\ -5 < y \le 13 \end{array}\right\} \Rightarrow \max(2x - 3y) = ?$$

A) 17 B) 7 C) 32 D) 9 E) 24

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

2. $a, c \in Z,\ b \in Z^+$

$$\left.\begin{array}{l} c < 0 \\ a < 2c \\ a + b + c = -19 \end{array}\right\} \Rightarrow \min(b) = ?$$

A) 1 B) 2 C) 3 D) 4 E) 5

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

3. $\mathbf{a < 0 < b < 1}$

aşağıdakilerden hangisi doğrudur?

Which one of the followings is true?

A) $a^2 < b^2$ B) $a + 1 > b$ C) $a \cdot b < b^2$ D) $a^2 < a \cdot b$ E) $a = b + 1$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

4. $a \cdot |a| < 0$,

$b \cdot |b| > 0$

ise aşağıdakilerden hangisi doğrudur?

Which one of the followings is true?

A) $a^3 \cdot b^3 > 0$ B) $a^{15} \cdot b^{15} > 0$ C) $a^7 \cdot b^4 > 0$ D) $a^4 \cdot b^7 > 0$ E) $a^{10} \cdot b^{10} < 0$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016 / 1]

5. $x, y \in Z^+$,

$$\left.\begin{array}{l} 2x + y < 39 \\ y > 5 \end{array}\right\} \Rightarrow \max(x - y) = ?$$

A) 4 B) 8 C) 10 D) 11 E) 12

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016 / 1]

6. $k, p, m \in Z^+$,

$$\left.\begin{array}{l} 13 \le k < 21 \\ 9 < p \le 19 \\ 2 < m \le 6 \end{array}\right\} \Rightarrow \max\left(\frac{k-p}{m}\right) = ?$$

A) $\frac{10}{3}$ B) 2 C) $\frac{12}{5}$ D) $\frac{1}{5}$ E) $\frac{3}{5}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016 / 2]

7. $a, b, c \in Z,\ b \in Z$

$$\left.\begin{array}{l} a^3 \cdot b^2 < 0 \\ b^3 \cdot c^3 > 0 \\ c^5 \cdot a^4 < 0 \end{array}\right\} \Rightarrow a, b, c = ?, ?, ?$$

A) –,–,– B) –,–,+ C) +,+,+ D) +,+,– E) +,–,–

[SELÇUK ÜNİVERSİTESİ – YÖS 2017]

8. $x, y, z \in R$,

$$\left.\begin{array}{l} x^2 \cdot y^3 \cdot z^4 > 0 \\ x^5 \cdot y^2 \cdot z^6 < 0 \\ x \cdot y \cdot z > 0 \end{array}\right\} \Rightarrow x, y, z = ?, ?, ?$$

A) –,+,– B) –,–,– C) +,–,– D) –,–,+ E) +,+,+

[EGE ÜNİVERSİTESİ – YÖS 2016]

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9. $\frac{2}{5} < x < \frac{3}{4} \Rightarrow$ **x = ?**

A) $\frac{3}{10}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) $\frac{4}{5}$ E) $\frac{5}{6}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2013]

10. $a < 0, \quad b < 0, \quad c < 0,$

$\frac{a}{2} = \frac{b}{3} = 4c \Rightarrow$ **? < ? < ?**

A) c < b < a B) b = c < a C) b < c < a D) c < a < b E) b < a < c

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2015]

11. $\frac{2}{7} < x < \frac{3}{7} \Rightarrow$ **x = ?**

A) $\frac{1}{14}$ B) $\frac{5}{14}$ C) $\frac{5}{6}$ D) $\frac{1}{4}$ E) $\frac{1}{2}$

[AFYON ÜNİVERSİTESİ – YÖS 2016 / 2]

12. $x, y \in Z,$

$\left.\begin{array}{l} -3 < x < 6 \\ -5 < y < 1 \end{array}\right\} \Rightarrow \max(x-y) = ?$

A) 11 B) 9 C) 5 D) –2 E) –8

[YÖS – 2005]

13. $a < 0,$

$\left.\begin{array}{l} a = 2b \\ b = \frac{c}{3} \end{array}\right\} \Rightarrow$ **? < ? < ?**

A) a < b < c B) a < c < b C) b < a < c D) c < a < b E) c < b < a

[YÖS – 2003]

14. $a, b, c \in R^+,$

$\left.\begin{array}{l} \frac{3a+b}{b} = 2 \\ \frac{b+2c}{c} = 4 \end{array}\right\} \Rightarrow$ **? < ? < ?**

A) a < c < b B) b < c < a C) b < a < c D) b < c < a E) c < a < b

[YÖS – 1998]

15. $\left.\begin{array}{l} 2a+b = 10 \\ a+2c = 14 \\ b+c = 7 \end{array}\right\} \Rightarrow$ **? < ? < ?**

A) b < a < c B) b < c < a C) a < b < c D) a < c < b E) c < a < b

[YÖS – 1997]

16. $a > 0, \quad b > 0, \quad c > 0$

$\left.\begin{array}{l} a \cdot b = \frac{1}{4} \\ a \cdot c = \frac{1}{5} \\ b \cdot c = \frac{2}{3} \end{array}\right\} \Rightarrow$ **? < ? < ?**

A) a < b < c B) a < c < b C) b < a < c D) b < c < a E) c < a < b

[YÖS – 1994]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	A	C	D	C	A	A	A
9	10	11	12	13	14	15	16
C	E	B	B	D	A	A	B

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BÖLÜM CHAPTER 9

TARİHSEL NOT / HISTORICAL NOTE

Banach Stefan [1892 - 1945]

Leh matematikçi, fonsiyonel analiz konusuna katkıları olan ilk kişilerdendir.

Polish mathematician who was a major contributor to the subject known as functional analysis.

MUTLAK DEĞER
ABSOLUTE VALUE

Bu bölüm 48 alıştırma sorusu, 176 test sorusu ve 16 YÖS sorusu içermektedir.

This chapter includes 48 exercise questions, 176 test questions and 16 YÖS questions.

BÖLÜM / CHAPTER 9

MUTLAK DEĞER / ABSOLUTE VALUE

- Mutlak Değer / Absolute Value .... 401 - 432

MUTLAK DEĞER
ABSOLUTE VALUE

1. $|3 - 8| - |2 + 6| = ?$

Yanıt / The Answer is –3

2. $|4 - 7| + |5 - 3| - |6 - 2| = ?$

Yanıt / The Answer is 1

3. $-|12 - 3| - |5 - 8| + |7 - 15| = ?$

Yanıt / The Answer is –4

4. $-|-15 + 2| + |-11 + 3| + |(-2)\cdot(4)| = ?$

Yanıt / The Answer is 3

5. $|-6|\cdot|4| - |-7| = ?$

Yanıt / The Answer is 17

6. $|-(-3)|\cdot|-8| - |7 - 9| = ?$

Yanıt / The Answer is 22

7. $|23 - 15|\cdot|21 - 25|\cdot|7 - 6| = ?$

Yanıt / The Answer is 32

8. $|\sqrt{5} - 3| + |\sqrt{5} - 2| = ?$

Yanıt / The Answer is 1

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9. $|\sqrt{7}-\sqrt{5}| + |2-\sqrt{5}| - \sqrt{7} = ?$

Yanıt / The Answer is –2

10. $|\sqrt{2}-1| + |\sqrt{2}-\sqrt{5}| - |\sqrt{5}-1| = ?$

Yanıt / The Answer is 0

11. $|4-\sqrt{10}| + |3-\sqrt{10}| + |5-6| = ?$

Yanıt / The Answer is 2

12. $-2 < x < 1$

$\Rightarrow \ |x+3| - |x-1| + |x+5| - |x-7| = ?$

Yanıt / The Answer is 4x

13. $-6 < x < -3$

$\Rightarrow \ |x+6| - |x+3| + |x| + |x+1| = ?$

Yanıt / The Answer is 8

14. $a < b < c < 0$

$\Rightarrow \ |b| + |a-c| - |b-c| = ?$

Yanıt / The Answer is –a

15. $0 < x < y < z$

$\Rightarrow \ |x-y| + |y-z| - |z-x| = ?$

Yanıt / The Answer is 0

16. $0 < x < y$

$\Rightarrow \ |x+y| + |x-y| + |y-x| + |-x| = ?$

Yanıt / The Answer is 3y

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17. $x < y < 0$

$\Rightarrow$ $|x - y| + |x + y| + |-x| - |-y| = ?$

Yanıt / The Answer is $y - 3x$

18. $0 < x$

$\Rightarrow$ $|x| - |-x| + |x + 2| + |-x - 7| = ?$

Yanıt / The Answer is $2x + 9$

19. $x < 0$

$\Rightarrow$ $|-x| - |-x + 1| + |x - 5| = ?$

Yanıt / The Answer is $4 - x$

20. $A = |3x - 18|$ $\Rightarrow$ min(A) için (for) $x = ?$

Yanıt / The Answer is 6

21. $A = 5 \cdot |x - 3| + 13$ $\Rightarrow$ min(A) = ?

Yanıt / The Answer is 13

22. $A = -2|x + 4| - 15$ $\Rightarrow$ max(A) $x = ?$

Yanıt / The Answer is –15

23. $A = |x - 3| + |x + 5|$ $\Rightarrow$ min(A) = ?

Yanıt / The Answer is 8

24. $|x + 2| + |y - 3| + |z - 6| = 0$ $\Rightarrow$ $x + y + z = ?$

Yanıt / The Answer is 7

METROPOL YAYINLARI • METROPOL PUBLICATIONS

25. $|x-4| + |y+5| + |z-6| = 0 \Rightarrow x + y + z = ?$

Yanıt / The Answer is 5

26. $|2x + y - 15| + |x - 3| = 0 \Rightarrow y = ?$

Yanıt / The Answer is 9

27. $|x - 2| = 7 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {–5, 9}

28. $|5x + 2| = 12 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\left\{-\frac{14}{5}, 2\right\}$

29. $2|x - 6| - 8 = 10 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {–3,15}

30. $5|x + 7| + 2 = -3 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is Ø

31. $2|x - 5| + 4|x - 5| = 24 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {1,9}

32. $|4x - 8| + |7x - 14| = 44 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {–2,6}

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33. $||x + 2| - 7| = 2 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {–11,–7,3,7}

34. $||x - 4| - 8| = 5 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {–9,1,7,17}

35. $2x + |x| - 12 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {4}

36. $|3x| + |4x| - x - 48 = 0 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {–6,8}

37. $|x - 3| + 2x = 9 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {4}

38. $|x + 2| = 6 - 3x \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {1}

39. $|x + 14| = |2x - 2| \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is {–4,16}

40. $|x + 4| = |3x - 2| \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $\left\{-\frac{1}{2}, 3\right\}$

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41. $|x - 7| < 15 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $-8 < x < 22$

42. $|3x - 4| \le 14 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $-\frac{10}{3} \le x \le 6$

43. $|2x + 5| \le 17 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $-11 \le x \le 6$

44. $|x - 4| \le 6,\ x \in Z \Rightarrow \sum x = ?$

Yanıt / The Answer is 52

45. $x \in Z,\ |x + 3| \le 5 \Rightarrow \sum x = ?$

Yanıt / The Answer is -33

46. $x \in Z,\ |x - 3| \ge 4 \Rightarrow \sum x = ?$

Yanıt / The Answer is -21

47. $x \in Z,\ |2x - 3| > 11 \Rightarrow \sum x = ?$

Yanıt / The Answer is -18

48. $5 \le |x - 4| \le 7 \Rightarrow$ **ÇK(SS) = ?**

Yanıt / The Answer is $[-3,-1] \cup [9,11]$

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1. $x < 5$

$\Rightarrow |x - 5| + x = ?$

A) $-2x + 5$ B) -5 C) $2x$ D) $2x + 5$ E) 5

2. $1 < x < 4$

$\Rightarrow |x - 1| + |x - 4| = ?$

A) $-2x + 5$ B) -5 C) 5 D) 3 E) $2x - 5$

3. $a < 0 < b < c$

$\Rightarrow |b - c| + |b - a| - |a - c| = ?$

A) $2b - 2c$ B) $2a - 2b$ C) 0 D) $2c - 2a$ E) $2a + 2b$

4. $x > x^2$

$\Rightarrow |x - 1| + |-x| = ?$

A) -1 B) $-2x$ C) 1 D) $2x - 1$ E) $2x + 1$

5. $2^x = 35$

$\Rightarrow |x - 7| - |8 - x| = ?$

A) -1 B) $-2x - 5$ C) 15 D) $2x - 15$ E) $2x + 1$

6. $x < x^3 < 0$

$\Rightarrow \left|x - \left|x - \left|\frac{x}{2}\right|\right|\right| = ?$

A) $-5x$ B) $-\frac{5x}{2}$ C) 0 D) $\frac{5x}{2}$ E) $5x$

7. $\left.\begin{array}{l} 3^x = 10 \\ 5^y = \frac{1}{10} \end{array}\right\} \Rightarrow |x - y| - |y + 1| + |x + y| = ?$

A) $x + y$ B) $x + 2y + 1$ C) $2x + y + 1$ D) 1 E) $x - y - 1$

8. $a < |a|$

$\Rightarrow |-a - |a|| - |a| = ?$

A) $-2a$ B) $-a$ C) a D) $2a$ E) $3a$

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9. $|x + y - 8| + |x - y - 2| = 0$

$\Rightarrow$ **$x \cdot y = ?$**

A) 5 B) 7 C) 9 D) 12 E) 15

10. $\sqrt[4]{2x-8} + |-y-2| + (z+5)^2 = 0 \Rightarrow$ **$x + y + z = ?$**

A) –5 B) –3 C) –1 D) 1 E) 3

11. $0 < x < y < z$

$\Rightarrow$ **$|x - z| + \sqrt{x^2 - 2xy + y^2} + |y - z| = ?$**

A) –2x B) –2x – 2y C) –2x – 2z D) 2z – 2x E) 2y – 2x

12. $a < -3$

$\Rightarrow$ **$\sqrt{a^2 + 3a + 4 + \sqrt{a^2 + 6a + 9}} = ?$**

A) –a – 3 B) –a –1 C) a – 1 D) 1 – a E) 3 – a

13. $x < 0, \quad y > 0$

$\Rightarrow$ **$\sqrt{x^2 - 2xy + y^2} + \sqrt[4]{x^4} + \sqrt[4]{y^4} = ?$**

A) 2x – 2y B) 2y – 2x C) 0 D) 2x + 2y E) –2x – 2y

14. $a, b, c \in Z^+$,

$\frac{1}{a} < \frac{1}{b} < \frac{1}{c} \Rightarrow$ **$|a - b| - |b - c| + |a - c| = ?$**

A) 2a – 2b B) 2a – 2c C) 2a + 2b – c D) 2c – 2b E) 2b + 2c – 2a

15. **$|\sqrt{48} - 5| - |\sqrt{75} - 6| + |\sqrt{12} - 3| = ?$**

A) $-\sqrt{3} - 2$ B) $-2\sqrt{3} - 4$ C) $\sqrt{3} - 2$ D) $2 - 2\sqrt{3}$ E) $4\sqrt{3} - 4$

16. $x < 0 \Rightarrow$ **$\sqrt{x^2 - 2x + 1} - \sqrt{x^2 - 10x + 25} = ?$**

A) –6 B) –4 C) –2x – 4 D) –2x – 6 E) 2x – 5

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	D	C	C	A	B	C	C
9	10	11	12	13	14	15	16
E	B	D	B	B	A	C	B

1. $x < 0 < y,$

$\Rightarrow$ **$x + y + \sqrt{x^2 - 2xy + y^2} = ?$**

A) 0 B) 2x C) 2y D) x + y E) 2x + 2y

2. $\left.\begin{matrix} |x| > x \\ x^3y < 0 \end{matrix}\right\} \Rightarrow \sqrt[3]{(x-y)^3} + |x - y| = ?$

A) –x B) –y C) 0 D) x E) y

3. $a < 0 < b < c,$

$2b = |a|$

$\Rightarrow \dfrac{|a-b| - |b-c| - |a|}{|a| - |c|} = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

4. $a, b \in R^+,\quad 2 < \frac{a}{b} < 3$

$\Rightarrow$ **$|\, a + |a - 3b|\, | = ?$**

A) a B) 3a C) b D) 2b E) 3b

5. $a < b < 0$

$\Rightarrow \left|\dfrac{a-b}{b-a}\right| + \left|\dfrac{a^2 - b^2}{a+b}\right| = ?$

A) –a + 1 B) –a + b C) a + b D) –a – b + 1 E) –a + b + 1

6. $\left.\begin{matrix} a + b < b \\ ab < 0 \end{matrix}\right\}$ ve(and) $|a - 2| - |3 + b| - |a| - |2b| = -10$

$\Rightarrow$ **b = ?**

A) 2a + 1 B) 2a + 2 C) 1 D) 2 E) 3

7. $\sqrt{y^2 + 4y + 4} + |2x - 3y| = 0 \Rightarrow$ **x + y = ?**

A) –7 B) –5 C) –3 D) 3 E) 5

8. $|3a - b| + \sqrt{9a^2 - 6a + 1} = 0 \Rightarrow$ **a + b = ?**

A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{4}$ D) $\frac{3}{2}$ E) $\frac{4}{3}$

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9. $|a-2b| + |b-3c| + |c-2| = 0$

$\Rightarrow$ **$3a + 4b + 2c = ?$**

A) 48 B) 52 C) 60 D) 64 E) 72

10. $\left.\begin{matrix} a-b < 2c \\ |a-b-2c| = 3b-a \end{matrix}\right\} \Rightarrow \dfrac{2c-b}{c+b} = ?$

A) $-\frac{2}{3}$ B) $-\frac{1}{2}$ C) $\frac{1}{2}$ D) $\frac{2}{3}$ E) $\frac{3}{4}$

11. $a > 0$,

$a - b > 0$,

$a + b < 0$,

$b \cdot |a| - a \cdot |b| - |a \cdot b| = -6 \Rightarrow$ **$a \cdot b = ?$**

A) –4 B) –2 C) 2 D) 3 E) 4

12. $a, b, c \in R^+$, $\frac{1}{c} < \frac{1}{b} < \frac{1}{a}$

$|a-c| + |b-a| + |c-b| = ?$

A) 2a – 2c B) 2a + 2c C) 2c – 2a D) c – a E) c – 2a

13. $|2x-1| = 7 \Rightarrow$ **ÇK(SS) = ?**

A) {–5,3} B) {–3,4} C) {–5,4} D) {3,4} E) {4,5}

14. $|x-2a| = 5$, ÇK(SS) = $\{x_1, x_2\}$

$x_1 + x_2 = 24 \Rightarrow$ **$a = ?$**

A) 3 B) 4 C) 5 D) 6 E) 8

15. $|x-a| = a-3$, ÇK(SS) = $\{x_1, x_2\}$

$x_1 \cdot x_2 = -21 \Rightarrow$ **$a = ?$**

A) –2 B) –1 C) 1 D) 2 E) 3

16. $|a-b| = 3$,

$|x-a+b| = 7 \Rightarrow$ **$\sum x = ?$**

A) –3 B) –2 C) 0 D) 2 E) 3

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1	2	3	4	5	6	7	8
C	C	D	E	E	E	B	E
9	10	11	12	13	14	15	16
D	C	B	C	B	D	A	C

1. $|2x + 4| + |8 - y| = A \Rightarrow$ **min(A) için (for) x + y = ?**

A) 2 B) 4 C) 6 D) 8 E) 10

2. $\frac{48}{|x-1|+|2x-4|} = A \Rightarrow$ **max(A) = ?**

A) 48 B) 36 C) 24 D) 12 E) 16

3. $||x - 6| - 4| = 7 \Rightarrow$ **$\sum x$ = ?**

A) 5 B) 7 C) 10 D) 12 E) 16

4. $x \in R$,

$|x + 1| + |x + 2| + |x + 3| = A \Rightarrow$ **min(A) = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

5. $|2x - 13| = 3x - 8 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{21}{5}\right\}$ B) $\left\{\frac{21}{5}, 5\right\}$ C) $\left\{-5, \frac{21}{5}\right\}$ D) $\{0\}$ E) $\{-5\}$

6. $|2x - 2| + |5x - 5| - |6x - 6| = 5 \Rightarrow$ **$\sum x$ = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

7. $\left|\frac{1}{x} - 1\right| = 4 \Rightarrow$ **$\sum x$ = ?**

A) $-\frac{1}{15}$ B) $-\frac{2}{15}$ C) $-\frac{1}{5}$ D) $-\frac{4}{15}$ E) $-\frac{1}{3}$

8. $|2x - 1| - |x + 4| = 0 \Rightarrow$ **$\sum x$ = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $|x + 1| + |3x + 3| = 8 \Rightarrow \sum x = ?$

A) –1 B) –2 C) –3 D) –4 E) –5

10. $a^2 + |a| - 6 = 0 \Rightarrow \prod x = ?$

A) 8 B) 4 C) 0 D) –4 E) –8

11. $|x^2 - 2x + 4| + 8 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {4} B) {–2} C) {0} D) {1} E) ∅

12. $|x^2 - 1| - 6|x + 1| = 0 \Rightarrow \sum x = ?$

A) –6 B) –4 C) –2 D) 1 E) 2

13. $|x^2 - 6x + 9| - 2|x^2 - 9| = 0 \Rightarrow \sum x = ?$

A) –10 B) –9 C) –8 D) –7 E) –6

14. $|7 - |8 - |x - 11||| = 8 \Rightarrow \sum x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

15. $||x - 2| - 4| = 12 \Rightarrow \sum x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

16. $x \in Z$,

$|2x - |x - 2|| = 8 \Rightarrow \sum x = ?$

A) –2 B) –4 C) –6 D) 4 E) 6

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1	2	3	4	5	6	7	8
C	A	D	C	A	B	B	D
9	10	11	12	13	14	15	16
B	D	E	D	D	B	D	D

1. $|\sqrt{19} - 4| + |4 - \sqrt{19}| = ?$

A) 8
B) $2\sqrt{19}$
C) $2\sqrt{19} - 4$
D) $2\sqrt{19} - 8$
E) $8 - 2\sqrt{19}$

2. $2 < x < 5 \Rightarrow |x - 5| + |x - 2| = ?$

A) 1
B) 2
C) 3
D) 4
E) 5

3. $a < b < c \Rightarrow |b - a| + |a - c| + |c - b| = ?$

A) 2b
B) 2c – 2a
C) a – c
D) b – 2a
E) 2c – b

4. $x < 0 < y \Rightarrow |x - y| + |y - x| + |x \cdot y| = ?$

A) 2x – y
B) 2x – 2y + xy
C) 2y – 2x – xy
D) xy – 2x
E) xy – y – x

5. $a < b < 0 \Rightarrow |b - a| + |a + b| + |a - b| = ?$

A) b – 3a
B) b – 2a
C) b – a
D) a – b
E) a – 2b

6. $x < 0 \Rightarrow |x| + |-x| - |-2x| = ?$

A) –2x
B) –x
C) 0
D) x
E) 2x

7. $x < 0 < y \Rightarrow \sqrt{x^2} + \sqrt{(x-y)^2} - \sqrt{y^2} = ?$

A) –2x
B) –x
C) x
D) y
E) 2y

8. $-2 < x < 2 \Rightarrow \sqrt{x^2 - 4x + 4} + \sqrt{x^2 + 4x + 4} = ?$

A) 1
B) 2
C) 3
D) 4
E) 5

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9. $A = |2x - 11| \Rightarrow$ **min(A) = ?**

A) –11 B) –1 C) 0 D) 1 E) 11

10. $A = |x - 3| + |5 - x| \Rightarrow$ **min(A) = ?**

A) –2 B) 0 C) 1 D) 2 E) 5

11. $A = \dfrac{24}{|x-2|+|3x-8|} \Rightarrow$ **max(A) = ?**

A) 4 B) 6 C) 8 D) 36 E) 14

12. $A = |2x - 5|,\ 4x + 3y + 3 = 28$

$\Rightarrow$ **min(A) için (for) y = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

13. $x < |x| = y,$

$|y - x| + |x| + |y| - |-x| = 9 \Rightarrow$ **x = ?**

A) –3 B) –2 C) –1 D) 0 E) 3

14. $|2x + y - 3| + |x - 3y + 2| = 0 \Rightarrow$ **x + y = ?**

A) –2 B) 0 C) 1 D) 2 E) 4

15. $|x - 5| + |2y - 8| + |3z - 6| = 0 \Rightarrow$ **x – y + z = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

16. $|x - 3| = 3 - x \Rightarrow$ **? < x < ?**

A) $-\infty < x < 3$

B) $-\infty < x \leq 3$

C) $-3 < x < 3$

D) $-3 \leq x \leq 3$

E) $0 < x \leq 3$

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1	2	3	4	5	6	7	8
D	C	B	C	A	C	A	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	D	D	D	A	D	C	B

1. $x = 3 \Rightarrow |x-5| - |x-4| + |x+2| = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

2. $a < 0 < b < c$

$\Rightarrow |a-c| + |c-a| - |b-c| + |-a| - |b+c| = ?$

A) $-3a$ B) $-2a$ C) $-a$ D) $b-a$ E) $c-a$

3. $3 < x < 5 \Rightarrow |3-x| - |x-6| = ?$

A) -9 B) -3 C) 3 D) 9 E) $2x-9$

4. $-4 < x < 3 \Rightarrow |x+5| + |x-7| = ?$

A) $2x-2$ B) $2x+12$ C) -2 D) 2 E) 12

5. $x + 3 = 0 \Rightarrow |x - |x - |2x||| = ?$

A) 0 B) 3 C) 6 D) 9 E) 12

6. $2 < x < 5,\ -10 < y < -5$

$\Rightarrow \dfrac{|5-x|+|y+5|}{x+y} = ?$

A) -2 B) -1 C) 1 D) 2 E) $\dfrac{x+y+10}{x+y}$

7. $5 < x < 9 \Rightarrow |x-10| + |5-x| = ?$

A) $2x-5$ B) $2x+5$ C) -5 D) 5 E) 10

8. $x \in R$,

$|x-4| + |2x-8| = 18 \Rightarrow \sum x = ?$

A) -12 B) -8 C) 8 D) 10 E) 12

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9. $|x - 5y + 8| = -|3y - 6| \Rightarrow$ **x + y = ?**

A) 2 B) 4 C) 6 D) 8 E) 10

10. $x < y < z,\ z \cdot x > y \cdot z$

$\Rightarrow |x - z| - \sqrt{x^2 + 2xy + y^2} - (x + y) + |z| = ?$

A) –x B) y C) x + y D) x – z E) z – x

11. $x \in Z$,

$\left|\frac{4x-3}{3}\right| \le 3 \Rightarrow \sum x = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

12. $|x| < 3,\ y = \frac{4x}{3} - 1 \Rightarrow$ **? < y < ?**

A) $-5 < y < 5$ B) $-4 < y < 4$ C) $-5 < y < 3$ D) $-4 < y < 5$ E) $-3 < y < 5$

13. $x, y, m \in Z$,

$|m - 2x| + |x - y + 7| + |y - 3| = 0 \Rightarrow$ **m = ?**

A) –8 B) –6 C) –4 D) 4 E) 6

14. $x \in Z$,

$||x - 4| - 5| = 6 \Rightarrow \sum x = ?$

A) 12 B) 10 C) 8 D) 6 E) 4

15. $a < |a| \Rightarrow |a + |2a|| - |-2a| = ?$

A) –3a B) –2a C) –a D) a E) 2a

16. $-3 < x < 8$,

$|x - 8| + 2|x + 3| = 13 \Rightarrow$ **x = ?**

A) –3 B) –2 C) –1 D) 1 E) 3

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1	2	3	4	5	6	7	8
C	A	E	E	E	B	D	C
9	10	11	12	13	14	15	16
B	A	E	C	A	C	D	C

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1. $x < 0 < y \Rightarrow \frac{|x|}{x} - \frac{|y|}{y} = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

2. $a < 5 \Rightarrow |a + |a - 5|| = ?$

A) a – 5 B) 5 – a C) a D) 5 E) 7

3. $a < 0,\ b > 0,\ c < 0$

$\Rightarrow |b - a| + \sqrt[4]{a^4} + \sqrt[3]{8c^3} - |c - b| = ?$

A) b – a B) 3c – 2a C) 4c – a D) 2a E) a

4. $A = |2x - y| \Rightarrow \min(A)$ için (for) $\frac{y + x}{y - x} = ?$

A) –2 B) –1 C) 1 D) 2 E) 3

5. $a < 0 < b \Rightarrow \frac{|a - 2b|}{|-2b| + |-a|} = ?$

A) –a B) a C) –1 D) 1 E) 2

6. $|x + 3| = 5 \Rightarrow \sum x = ?$

A) –10 B) –8 C) –6 D) –4 E) –2

7. $|2x + 4| = 6 \Rightarrow \sum x = ?$

A) –4 B) –1 C) 2 D) 4 E) 6

8. $|3x - 8| = 4 \Rightarrow$ ÇK(SS) = ?

A) $\{4\}$ B) $\left\{\frac{4}{3}\right\}$ C) $\{-4\}$ D) $\{4, -4\}$ E) $\left\{\frac{4}{3}, 4\right\}$

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9. $|3x - 2| + 3 = 4 \Rightarrow$ **ÇK(SS) = ?**

A) $\varnothing$ B) {1} C) $\left\{\frac{1}{3}\right\}$
D) $\left\{\frac{1}{3}, 1\right\}$ E) {1, 3}

10. $2|x - 1| + 4 = 8 \Rightarrow$ **ÇK(SS) = ?**

A) {–3, –1} B) {–1, 3} C) {–1}
D) {1} E) {3}

11. $|x^2 - 2| = 7 \Rightarrow$ **ÇK(SS) = ?**

A) {–3} B) {3} C) {–3, 3}
D) {–5, 9} E) {9}

12. $||x - 1| + 1| = 3 \Rightarrow$ **ÇK(SS) = ?**

A) {–1, 3} B) {–4, 4} C) {–1, 4}
D) {–4, –1, 3} E) {–4, –1, 3, 4}

13. $2|x - 3| + |3 - x| = 12 \Rightarrow$ **ÇK(SS) = ?**

A) {–1, 7} B) {–7, 1} C) {–1}
D) {–7} E) {7}

14. $|x - 2| + |6 - 3x| = 8 \Rightarrow \sum x = ?$

A) 1 B) 2 C) 3
D) 4 E) 5

15. $||x - 3| + 4| = 7 \Rightarrow \sum x = ?$

A) 6 B) 4 C) 2
D) –1 E) –3

16. $|4x - 12| = x - 4 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{8}{3}\right\}$ B) $\left\{\frac{16}{5}\right\}$ C) $\left\{\frac{8}{3}, \frac{16}{5}\right\}$
D) $\varnothing$ E) $\left\{\frac{10}{3}, 7\right\}$

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1	2	3	4	5	6	7	8
A	D	B	E	D	C	A	E
9	10	11	12	13	14	15	16
D	B	C	A	A	D	A	D

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1. $x < 0 < y \Rightarrow \dfrac{3|x-y|}{|y+|x||} = ?$

A) $-3x$ B) $-3y$ C) $x + y$ D) -3 E) 3

2. $x \in Z$,

$|3x - 15| + |10 - 2x| \geq 25 \Rightarrow \sum x = ?$

A) -55 B) -45 C) 0 D) 45 E) 55

3. $3 < x < 4 < y < 5$

$\Rightarrow |5x + 4y - 30| + |4x + 5y - 42| + |x - y| = ?$

A) $10x + 8y - 72$ B) $10x - 12$ C) $8y - 12$ D) -12 E) 12

4. $x < 0$

$\Rightarrow \sqrt{4x^2} + \sqrt[3]{-27x^3} + \sqrt[4]{(-x)^4} = ?$

A) $-6x$ B) $-4x$ C) $-2x$ D) $2x$ E) $6x$

5. $|3x - y - 9| + |2x + 3y - 17| = 0 \Rightarrow x^2 + y^2 = ?$

A) 16 B) 18 C) 20 D) 25 E) 36

6. $4 < a < 8 \Rightarrow \dfrac{|a-4|-|a+6|}{|a+3|-|a-2|} = ?$

A) $a - 2$ B) $a + 2$ C) -2 D) 0 E) 2

7. $x \in Z$,

$3 < |4 - x| < 6 \Rightarrow \sum x = ?$

A) 18 B) 16 C) 14 D) 9 E) 8

8. $3^x = 108 \Rightarrow |2x - 10| + 3|x - 1| + x = ?$

A) $2x + 7$ B) $2x + 5$ C) $2x + 3$ D) $2x - 1$ E) $2x - 3$

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9. $x \in R$,

$|x + 2| + |x - 4| + |x - 6| = A \Rightarrow$ **min(A) = ?**

A) 4 B) 6 C) 8 D) 10 E) 14

10. $x \in Z$,

$|2x - 3| > 5 \Rightarrow \sum x = ?$

A) –9 B) –7 C) –3 D) 7 E) 9

11. $|3x - 6| + |x^2 - 4| = 0 \Rightarrow$ **$|x - 4| + |4 - x| = ?$**

A) 2 B) 4 C) 6 D) 8 E) 12

12. $x, y \in Z$,

$|2x + 3| < 7$, $|y - 2| < 5$

$3x + 2y = A \Rightarrow$ **max(A) = ?**

A) 6 B) 9 C) 12 D) 15 E) 18

13. $x, y \in R$, $y = x + 3$,

$m|x - y| + 3|y - x| = 15 \Rightarrow$ **m = ?**

A) –2 B) –1 C) $\frac{1}{2}$ D) 1 E) 2

14. $|6 - |5 - |x - 3||| = 9 \Rightarrow \sum x = ?$

A) 6 B) 8 C) 12 D) 17 E) 23

15. $3x - y = 34$, $|x - 6y| = A$

$\Rightarrow$ **min(A) için (for) x = ?**

A) 8 B) 12 C) 14 D) 16 E) 18

16. $x < y < 0$,

$|x + y| - |x - y| = 24 \Rightarrow$ **y = ?**

A) –12 B) –10 C) –8 D) –6 E) –4

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1	2	3	4	5	6	7	8
E	B	E	A	D	C	B	A
9	10	11	12	13	14	15	16
C	A	B	D	E	A	B	A

1. $|2x - 3| = 1 \Rightarrow$ **ÇK(SS) = ?**

A) {1} B) {2} C) {1, 2} D) {–1} E) {–2, –1}

2. $|4x - 1| + 6 = 9 \Rightarrow \sum x = ?$

A) –1 B) $-\frac{1}{2}$ C) 0 D) $\frac{1}{2}$ E) 1

3. $|2x + 1| = 2x - 5 \Rightarrow$ **ÇK(SS) = ?**

A) {1} B) $\left\{\frac{1}{7}\right\}$ C) $\left\{\frac{1}{7}, 1\right\}$ D) {–1} E) ∅

4. $|2x - 1| = x + 2 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{-3, -\frac{1}{3}\right\}$ B) $\left\{-\frac{1}{3}\right\}$ C) {3} D) $\left\{-3, \frac{1}{3}\right\}$ E) $\left\{\frac{-1}{3}, 3\right\}$

5. $|x + 2| - 3x + 2 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) ∅ B) {2} C) {0} D) {–2, 0} E) {0, 2}

6. $\left.\begin{array}{l} |a| + 5 = b \\ |a| + |b - 5| = 4 \end{array}\right\} \Rightarrow$ **b = ?**

A) 8 B) 7 C) 6 D) 3 E) 2

7. $|2x - 3| = |x + 3| \Rightarrow$ **ÇK(SS) = ?**

A) {0} B) {–3} C) {6} D) {0,6} E) {–6, 0}

8. $x \in Z$,

$|3 - 2x| < 7 \Rightarrow \sum x = ?$

A) 12 B) 9 C) 7 D) 4 E) 2

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9. $\left|\frac{x+1}{3}\right| < 1 \Rightarrow$ **ÇK(SS) = ?**

A) (–4, 2) B) [–4, 2) C) (0, 2) D) (–4, 0) E) (–4, 2]

10. $x, y \in Z$,
$\left.\begin{matrix}|3x-7|<5\\|2y+5|\leq 3\end{matrix}\right\} \Rightarrow$ **min(x – 2y) = ?**

A) –1 B) 0 C) 1 D) 2 E) 3

11. $x \in Z$,
$1 \leq |2x+3| \leq 5 \Rightarrow \sum x = ?$

A) –9 B) –8 C) –6 D) –4 E) –2

12. $||x+2|+1| < 5 \Rightarrow$ **ÇK(SS) = ?**

A) (–6, 2) B) (–6, –2) ∪ (–2, 2) C) (–2, 2) D) (–6, –2) E) (–2, 6)

13. $|x^2-16| + 3\cdot|x+4| = 0 \Rightarrow \sum x = ?$

A) –5 B) –4 C) –1 D) 2 E) 4

14. $|x-2| \leq |x+4| \Rightarrow$ **ÇK(SS) = ?**

A) (–1, ∞) B) (–1, 1) C) [–1, ∞) D) [–1, 1) E) (–∞, –1]

15. $|x-3|^{x^2-9} = 1 \Rightarrow \sum x = ?$

A) 1 B) 3 C) 5 D) 6 E) 9

16. $x \in R^-$,
$|8-2x| > 14 \Rightarrow$ **max(x) = ?**

A) –6 B) –4 C) –3 D) –2 E) –1

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1	2	3	4	5	6	7	8
C	D	E	E	B	B	D	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
A	E	A	A	B	C	B	B

1. $\dfrac{72}{|x+3|+|2x-6|} = A \Rightarrow$ **max(A) = ?**

A) 12 B) 18 C) 24 D) 25 E) 36

2. $||x-1|-4| = 6 \Rightarrow$ **$\sum x = ?$**

A) 0 B) 2 C) 4 D) 6 E) 19

3. $x, y \in R^+$, $1 < y < x$,

$|y-1| + |y-x| = 7 \Rightarrow$ **x = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

4. $y \in Z$, $|x-1| < 5$,

$x - y + 3 = 0 \Rightarrow$ **$\sum y = ?$**

A) 21 B) 28 C) 33 D) 35 E) 36

5. $|2x-4| + |x+2| = 8 \Rightarrow$ **$\sum x = ?$**

A) –4 B) $-\frac{4}{3}$ C) $\frac{4}{3}$ D) $\frac{10}{3}$ E) $\frac{14}{3}$

6. $|3x-2| \le 1$,

$3 < |x+4| \Rightarrow$ **ÇK(SS) = ?**

A) $\left(\frac{1}{3}, 1\right]$ B) $\left[\frac{1}{3}, 1\right]$ C) (–1, 1] D) (–2, 2) E) (0, 1]

7. $|x-3| - 3x = 12 \Rightarrow$ **$\sum x = ?$**

A) $-\frac{39}{4}$ B) $-\frac{15}{2}$ C) $-\frac{15}{4}$ D) $-\frac{9}{4}$ E) $-\frac{1}{4}$

8. $\left|\frac{2}{x} - 1\right| = 3 \Rightarrow$ **$\sum x = ?$**

A) –1 B) $-\frac{1}{2}$ C) 0 D) $\frac{1}{2}$ E) 1

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9. $|x-4| + |x+2| = 7 \Rightarrow \sum x = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

10. $x \in Z$,

$-1 \le |x-3| < 5 \Rightarrow \sum x = ?$

A) 9 B) 12 C) 27 D) 32 E) 36

11. $\dfrac{6}{|x-2|+|2x-1|} = A \Rightarrow \max(A) = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

12. $|x+1| \le 5$,

$2x + 3y = 0 \Rightarrow ? \le y \le ?$

A) $\left[-\frac{8}{3}, 6\right]$ B) $\left[-\frac{8}{3}, 4\right]$ C) $\left[\frac{8}{3}, 6\right]$ D) $\left[\frac{8}{3}, 7\right]$ E) $\left[-6, \frac{8}{3}\right]$

13. $|x-1| + |x+5| = 5 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{-\frac{9}{2}\right\}$ B) $\left\{-\frac{9}{2}, \frac{1}{2}\right\}$ C) $\left\{\frac{1}{2}\right\}$ D) R E) ∅

14. $||2 + x| + 3| \le 6 \Rightarrow$ **ÇK(SS) = ?**

A) (–5, 1) B) (–5, –1] C) [–5, –1] D) [–5, 1] E) [–5, 5]

15. $x = |y+1| + 3$

$|y+1| + |2x-6| = 12 \Rightarrow$ **x = ?**

A) 4 B) 6 C) 7 D) 8 E) 9

16. $x \in Z$,

$\left|\dfrac{1}{x-3}\right| \ge \dfrac{1}{5} \Rightarrow \sum x = ?$

A) 18 B) 24 C) 26 D) 28 E) 30

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1	2	3	4	5	6	7	8
A	B	E	E	C	B	D	B
9	10	11	12	13	14	15	16
E	C	E	B	E	D	C	E

1. $|3x - 3| + 6 = |1 - x| \Rightarrow$ **ÇK(SS) = ?**

A) ∅ B) 1 C) 2 D) 3 E) R

2. $|2x - 1| + |4x - 2| + |6x - 3| = 30 \Rightarrow$ **ÇK(SS) = ?**

A) {–3, –2} B) {–2, 0} C) {–2, 3} D) {0, 2} E) {2, 3}

3. $\sqrt{x^2 + 4x + 4} + |2x + 4| = 6 \Rightarrow \sum x = ?$

A) –6 B) –4 C) 0 D) 4 E) 6

4. $|x^2 - 1| - 4|x - 1| = 0 \Rightarrow \prod x = ?$

A) –15 B) –9 C) 9 D) 12 E) 15

5. $y < x < 0$,
$|x - y| = 6$,
$|x - 2| = 20 \Rightarrow$ **y = ?**

A) –36 B) –24 C) –18 D) –12 E) –10

6. $|a - b| = 1$,
$|2x - a + b| = 7 \Rightarrow \sum x = ?$

A) –8 B) –6 C) 0 D) 6 E) 8

7. $||x - 4| - 5| = 5 \Rightarrow \sum x = ?$

A) 3 B) 6 C) 9 D) 12 E) 15

8. $||2x - 3| - 6| = 9 \Rightarrow$ **ÇK(SS) = ?**

A) {–9, –6} B) {–9, 0} C) {–6, 3} D) {0, 6} E) {–6, 9}

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $x \in N^+$,

$|3x - 12| = -3x + 12 \Rightarrow \sum x = ?$

A) 3 B) 5 C) 7 D) 10 E) 16

10. $|x - 1| = 3x - 2 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{-1}{2}\right\}$ B) $\left\{-\frac{2}{3}\right\}$ C) $\left\{-\frac{3}{4}\right\}$ D) $\left\{\frac{2}{3}\right\}$ E) $\left\{\frac{3}{4}\right\}$

11. $x + 2|x - 1| = 4 \Rightarrow \sum x = ?$

A) –5 B) –3 C) 0 D) 3 E) 5

12. $|x + 4| = |x - 1| \Rightarrow x = ?$

A) $-\frac{4}{3}$ B) $-\frac{3}{2}$ C) $-\frac{1}{2}$ D) $\frac{3}{2}$ E) $\frac{4}{3}$

13. $|2x - 3| = |x + 1| \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{-\frac{2}{3}, 1\right\}$ B) $\left\{-\frac{2}{3}, 2\right\}$ C) $\left\{\frac{2}{3}, 1\right\}$ D) $\left\{\frac{2}{3}, 3\right\}$ E) $\left\{\frac{2}{3}, 4\right\}$

14. $|x - 3| + |x - 2| = 9 \Rightarrow \sum x = ?$

A) 3 B) 5 C) 7 D) 10 E) 15

15. $|2x - |x - 1|| = 4 \Rightarrow \sum x = ?$

A) 0 B) 2 C) 3 D) 5 E) 7

16. $x \cdot |x - 1| = 12 \Rightarrow$ **ÇK(SS) = ?**

A) {1} B) {2} C) {3} D) {4} E) {5}

METROPOL YAYINLARI • METROPOL PUBLICATIONS

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	C	B	A	B	C	D	E
9	10	11	12	13	14	15	16
D	E	C	B	E	B	B	D

1. $\dfrac{36}{|x-2|+|x-4|} = A \Rightarrow$ **max(A) = ?**

A) 6 B) 9 C) 12 D) 18 E) 36

2. $3^a = 12 \Rightarrow$ **$|a-2| + |3-a| = ?$**

A) 2a B) a C) 0 D) 1 E) 5

3. $x \in R^+$,

$A = |x - 2y| + |y - 4z|$

$\Rightarrow$ **min(A) için (for) ? < ? < ?**

A) x < y < z B) x < z < y C) y < x < z D) z < x < y E) z < y < x

4. **$|2 - \sqrt{7}| + |4 - \sqrt{7}| = ?$**

A) $-2 + 2\sqrt{7}$ B) $6 - 2\sqrt{7}$ C) –2 D) 2 E) 6

5. $0 < x < \dfrac{2}{5}$

$\Rightarrow$ **$|5x - 2| + |-x - 1| = ?$**

A) –6x + 3 B) –4x – 1 C) –6x – 1 D) –4x + 3 E) 4x – 3

6. $|x^2 - x - 6| + 2|x - 3| = 0 \Rightarrow$ **x = ?**

A) –3 B) –1 C) 0 D) 1 E) 3

7. $|3x - 4| = 5 \Rightarrow$ **$\sum x = ?$**

A) $\frac{8}{3}$ B) $\frac{10}{3}$ C) $\frac{14}{3}$ D) $\frac{16}{3}$ E) $\frac{19}{3}$

8. $|a - b| = 7$,

$|b + 2| = 4 \Rightarrow$ **$\sum a = ?$**

A) –10 B) –8 C) –6 D) 8 E) 10

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $A = |2x - 3y|$

$\Rightarrow$ **min(A) için (for)** $\dfrac{4x+y}{4y} = ?$

A) $\frac{5}{2}$ B) $\frac{5}{4}$ C) $\frac{7}{2}$ D) $\frac{7}{4}$ E) $\frac{9}{4}$

10. $2|x| - |x-1| = 2 \Rightarrow \sum x = ?$

A) –4 B) –2 C) 0 D) 2 E) 4

11. $x < 0$,

$|x| + |-x| - |2x| = A \Rightarrow \sum A = ?$

A) –4x B) –2x C) 0 D) 2x E) 4x

12. $a < 0 < b$,

$|a| < |b| \Rightarrow |-a-b| - |b+a| = ?$

A) –2a B) –2b C) 0 D) 2a E) 2b

13. $x^2 - 4|x| - 12 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) {–6,6} B) {–6,0} C) {0,6} D) {–6} E) {–6}

14. $x \in Z$,

$3 < |2x+1| < 11 \Rightarrow \sum x = ?$

A) –5 B) –3 C) 5 D) 7 E) 10

15. $|x^2 - 4x + 4| < 0 \Rightarrow$ **ÇK(SS) = ?**

A) ∅ B) {–2} C) {2} D) {–2,2} E) R

16. $|x-1| < 5 \Rightarrow x^2 \in (?, ?)$

A) [0,5) B) [0,15) C) [0,25) D) [0,36) E) [0,49)

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	D	E	D	D	E	A	B
9	10	11	12	13	14	15	16
D	B	C	C	A	B	A	D

METROPOL YAYINLARI • METROPOL PUBLICATIONS

1. $a < 0 < b$

$|a - b| + |a| - |b| = 10 \Rightarrow$ **a = ?**

A) –10 B) –5 C) 0 D) 5 E) 10

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

2. $|2x - 1| + 9 - x = 0 \Rightarrow$ **x = ?**

A) –8 B) –4 C) $\frac{2}{3}$ D) $\frac{10}{3}$ E) ∅

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

3. $b < 0 < a \Rightarrow \sqrt{(3a-b)^2} - \sqrt{(b-a)^2} = ?$

A) 2a B) 4a C) 2a – 2b D) 4a – 2b E) –4a + 2b

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

4. $|x| = -x, \quad y^2 < y$

$\Rightarrow |x - y| - \sqrt{x^2} - \sqrt{y^2} + 3|x| = ?$

A) 3x B) 0 C) –3x D) 2x E) –2

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

5. $|2x - 13| + x = 7 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{6, \frac{20}{3}\right\}$ B) {6} C) {6,7} D) $\left\{\frac{20}{3}\right\}$ E) $\left\{\frac{10}{3}, 7\right\}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

6. $x, y \in Z$

$|x| + |y| = 2 \cdot |x|$

$2x + y = 12 \Rightarrow$ **min(y) = ?**

A) –4 B) –10 C) –12 D) –24 E) –50

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

7. $x + 3 \cdot |x - 1| + 2 = 0 \Rightarrow$ **ÇK(SS) = ?**

A) $\left\{\frac{-1}{4}, \frac{-5}{2}\right\}$ B) $\left\{\frac{1}{4}\right\}$ C) $\left\{\frac{5}{2}\right\}$ D) $\left\{-\frac{1}{4}, \frac{5}{2}\right\}$ E) ∅

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

8. $a < 0 < b$

$\Rightarrow \frac{a \cdot |b - a|}{||a| + b|} = ?$

A) –a B) a C) b D) –b E) 1

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $y < 0 < x \Rightarrow |y| - |x - y| + |x| = ?$

A) x B) y C) –x D) –y E) 0

[BALIKESİR ÜNİVERSİTESİ – YÖS 2017]

10. $\left.\begin{array}{l} a = \frac{1}{36} \\ b = \frac{1}{4} \\ c = \frac{1}{3} \end{array}\right\} \Rightarrow |a - |b - c|| = ?$

A) $-\frac{1}{18}$ B) $\frac{1}{18}$ C) $-\frac{1}{9}$ D) $\frac{1}{9}$ E) $\frac{1}{36}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2015]

11. $a^2 < a, \quad |b| > b$

$\Rightarrow \frac{|a - b| + |b|}{|-a + 2b|} = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2014]

12. $a, b, c \in N^+$

$\frac{1}{a} > \frac{1}{b} > \frac{1}{c}$

$\Rightarrow |a - b| - |a - c| - |b - c| = ?$

A) 2b – 2c B) –2a C) a – 2b D) –b E) 2c

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2014]

13. $x \cdot y > 0, \quad x^2 y < 0$

$\Rightarrow \frac{|x| - |x + y| - 1}{1 - y} = ?$

A) –x B) x C) –1 D) 0 E) 1

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2014]

14. $|x - 1| < 2$

$\Rightarrow |x + 2| + |x - 3| + |x - 4| = ?$

A) x – 3 B) –x + 9 C) x + 1 D) 2x – 1 E) x – 1

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2013]

15. $x < \frac{5}{3}$

$\Rightarrow |5 - 3x| - \sqrt{9x^2 - 30x + 25} + 3x - 1 = ?$

A) 4 B) 3x – 1 C) 9 – 3x D) 3x – 9 E) 1 – 3x

[İSTANBUL ÜNİVERSİTESİ – YÖS 2013]

16. $-4 < x < 2,$

$\sqrt{(x - 2)^2} + \sqrt{(x + 4)^2} + x = 4 \Rightarrow x = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

[ANKARA ÜNİVERSİTESİ – YÖS 2013]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	E	A	C	A	C	E	B
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
E	B	D	A	C	B	B	A

METROPOL YAYINLARI • METROPOL PUBLICATIONS

BÖLÜM CHAPTER 10

TARİHSEL NOT / HISTORICAL NOTE

Maryam Mirzakhani [1977 - 2017]

İranlı matematikçi ve Stanford Üniversitesi matematik profesörü. Araştırma konuları arasında Teichmüller teorisi, hiperbolik geometri, ergodik teori ve semlectic geometri yer almaktadır. 13 Ağustos 2014'te Fields Madalyası (matematiğin en prestijli ödülü) ile onurlandırıldı. Böylece, bu ödülle onurlandırılan ilk kadın ve ilk İranlı oldu. Ödül komitesi çalışmalarını "dinamizm ve geometride, Riemann yüzeylerinin ve moduli uzayları" konularında onurladı.

She was an Iranian mathematician and a professor of mathematics at Stanford University.Her research topics included Teichmüller theory, hyperbolic geometry, ergodic theory, and symplectic geometry. On August 13th 2014, she was honored with the Fields Medal (the most prestigious award in mathematics.) Thus, she became both the first woman and the first Iranian to be honored with this award at the same time.The award committee cited her work in "the dynamics and geometry of Riemann surfaces and their moduli spaces".

MANTIK
LOGIC

Bu bölüm 16 alıştırma sorusu ve 16 test sorusu içermektedir.

This chapter includes 16 exercise questions and 16 test questions.

BÖLÜM / CHAPTER 10

MANTIK / LOGIC

- Mantık / Logic. . . . . 433 - 438

MANTIK
LOGIC

1. $p \equiv 0,\ q \equiv 1 \Rightarrow (p \vee q) \wedge p' \equiv ?$

Yanıt / The Answer is 1

2. $p \equiv 0,\ q \equiv 1,\ r \equiv 0 \Rightarrow p \vee (q' \wedge r) \equiv ?$

Yanıt / The Answer is 0

3. $p \equiv 1,\ q \equiv 1,\ r \equiv 0 \Rightarrow (p \vee q)' \wedge r' \equiv ?$

Yanıt / The Answer is 0

4. $p \equiv 1,\ q \equiv 0,\ r \equiv 1 \Rightarrow (p \wedge r) \Rightarrow (q \vee r)' \equiv ?$

Yanıt / The Answer is 0

5. $p \equiv 1,\ q \equiv 1,\ r \equiv 1 \Rightarrow [q \Rightarrow (p \vee r')] \equiv ?$

Yanıt / The Answer is 1

6. $p \equiv 0,\ q \equiv 1,\ r \equiv 1 \Rightarrow [p' \wedge (p \vee q)] \Rightarrow r' \equiv ?$

Yanıt / The Answer is 0

7. $p \equiv 0,\ q \equiv 1,\ r \equiv 0 \Rightarrow (p' \vee r) \Leftrightarrow [q \Rightarrow (p \wedge q')] \equiv ?$

Yanıt / The Answer is 0

8. $p \equiv 1,\ q \equiv 1,\ r \equiv 0 \Rightarrow (p' \Leftrightarrow q) \vee [(p \vee q) \wedge r'] \equiv ?$

Yanıt / The Answer is 1

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $p \equiv 1,\quad q \equiv 0,\quad r \equiv 1 \quad \Rightarrow \quad [(p' \wedge q) \vee r]' \equiv ?$

Yanıt / The Answer is 0

10. $p \equiv 0,\quad q \equiv 0,\quad r \equiv 1 \quad \Rightarrow \quad [r \wedge (q' \vee p)] \wedge (p' \vee q) \equiv ?$

Yanıt / The Answer is 1

11. $p' \vee [(1 \wedge 0) \vee (1 \vee 1)]' \equiv 1 \quad \Rightarrow \quad p \equiv ?$

Yanıt / The Answer is 0

12. $p' \vee [q \wedge (q \vee p')] \equiv ?$

Yanıt / The Answer is $p' \vee q$

13. $p \vee (q' \wedge r)' \equiv 0 \quad \Rightarrow \quad (p,q,r) \equiv ?$

Yanıt / The Answer is (0,0,1)

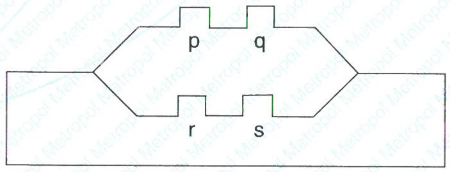
14. $p' \wedge (q \vee r)' \equiv 1 \quad \Rightarrow \quad (p,q,r) \equiv ?$

Yanıt / The Answer is (0,0,0)

15. $p \Rightarrow (q \vee r') \equiv 0 \quad \Rightarrow \quad (p,q,r) \equiv ?$

Yanıt / The Answer is (1,0,1)

16.



$\equiv ?$

Yanıt / The Answer is $(p \wedge q) \vee (r \wedge s)$

METROPOL YAYINLARI • METROPOL PUBLICATIONS

1. $p \vee (p \vee q)' \equiv ?$

A) p B) p´ C) q D) q´ E) p v q´

2. $(p \wedge q) \vee (p \wedge q') \equiv ?$

A) p B) q C) q´ D) p∨q E) p´

3. $(p \vee q) \wedge (p' \wedge q)' \equiv ?$

A) q B) q´ C) p D) p´ E) p∧q

4. $p \equiv 1, \quad q \equiv 0, \quad r \equiv 1 \quad \Rightarrow \quad [r \wedge (q' \vee p)]' \equiv ?$

A) p B) q C) r D) q´ E) 1

5. $p \equiv 0, \quad q \equiv 0, \quad r \equiv 1 \quad \Rightarrow \quad (p' \wedge q) \vee (r \wedge p)' \equiv ?$

A) p B) q C) r D) r´ E) 0

6. $p \wedge (p \Rightarrow q) \equiv ?$

A) p B) q C) 1 D) 0 E) p∧q

7. $p \vee (p \Rightarrow q) \equiv ?$

A) 0 B) 1 C) p D) q E) p∨q

8. $(p' \vee q) \wedge (p \wedge q') \equiv ?$

A) 0 B) 1 C) p D) q E) p´

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $[p \Rightarrow (p \wedge q)]' \equiv$?

A) $p \vee q$ B) $p \wedge q$ C) $p' \wedge q$ D) $p \wedge q'$ E) $p \vee q'$

10. $[(p \wedge q) \Rightarrow q]' \equiv$?

A) 1 B) q C) p' D) q' E) $p \vee q$

11. $p \wedge (q' \wedge r) \equiv 1 \Rightarrow$ **(p,q,r) ≡ ?**

A) (0,0,0) B) (0,1,0) C) (1,0,1) D) (1,1,0) E) (1,1,1)

12. $p' \vee (q \wedge r)' \equiv 0 \Rightarrow$ **(p,q,r) ≡ ?**

A) (0,0,0) B) (1,0,1) C) (1,1,0) D) (0,1,1) E) (1,1,1)

13. $(p \wedge q')' \vee r' \equiv 0 \Rightarrow$ **(p,q,r) ≡ ?**

A) (0,0,1) B) (1,0,0) C) (1,0,1) D) (1,1,0) E) (1,1,1)

14. $(p' \Rightarrow q)' \wedge r' \equiv 1 \Rightarrow$ **(p,q,r) ≡ ?**

A) (0,0,0) B) (1,0,1) C) (0,0,1) D) (1,1,0) E) (1,1,1)

15. $(p' \wedge q) \Rightarrow (r \wedge q) \equiv 0 \Rightarrow$ **(p,q,r) ≡ ?**

A) (0,1,0) B) (0,1,1) C) (1,0,0) D) (0,0,1) E) (1,1,1)

16. $(p \vee q')' \Rightarrow r \equiv 0 \Rightarrow$ **(p,q,r) ≡ ?**

A) (0,0,1) B) (1,0,0) C) (1,0,1) D) (1,1,0) E) (0,1,0)

METROPOL YAYINLARI • METROPOL PUBLICATIONS

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	A	C	B	C	E	B	A
9	10	11	12	13	14	15	16
D	A	C	E	C	A	A	E

BÖLÜM CHAPTER 11

TARİHSEL NOT / HISTORICAL NOTE

Cantor, Georg (Ferdinand Ludwig Philipp) [1845 – 1918]

St. Petersburg'da doğmuş, hayatının büyük bir kısmını Almanya'da Halle Üniversitesi'nde geçirmiştir. 1873'de rasyonel sayılar kümesinin sayılamaz olduğunu göstermiştir. Aynı zamanda reel sayılar kümesinin de sayılamaz sonsuzlukta olduğunu göstermiştir. Daha sonra sonsuz kümeler kuramını geliştirmiştir.

He was born in St Petersburg, but spent most of his life at the University of Halle in Germany. In 1873, he showed that the set of rational numbers is denumerable. He also showed that the set of all real numbers is not. Later he fully developed his theory of infinite sets.

KÜMELER
SETS

Bu bölüm 64 alıştırma sorusu, 192 test sorusu ve 16 YÖS sorusu içermektedir.

This chapter includes 64 exercise questions, 192 test questions and 16 YÖS questions.

BÖLÜM / CHAPTER 11

KÜMELER / SETS

- Kümeler / Sets .... 439 - 474

KÜMELER
SETS

Kümeler / Sets

1. $A = \{1, 3, 5, \{3\}, \{5\}, \{1, 2\}, x\}$

$\Rightarrow$ **n(A) = ?**

Yanıt / The Answer is 7

2. $A = \{x \mid 2 < x < 13, \quad x \in N\}$

$\Rightarrow$ **n(A) = ?**

Yanıt / The Answer is 10

3. $B = \{x \mid x \leq 42, \quad x = 3k, \quad k \in N^{+}\}$

$\Rightarrow$ **n(B) = ?**

Yanıt / The Answer is 14

4. B = {"METROPOL" sözcüğünün harfleri},

B = {letters of word "METROPOL"}

$\Rightarrow$ **n(B) = ?**

Yanıt / The Answer is 7

5. **$A = \{1, 2, 3, 4, 7\}$ A kümesinin alt küme sayısı kaçtır?**

What is the number of subsets of set A?

Yanıt / The Answer is 32

6. **$A = \{x \mid 3 < x \leq 19,$ x asal sayı / prime number$\}$ A kümesinin özalt küme sayısı kaçtır?**

What is the number of proper subsets of set A?

Yanıt / The Answer is 63

7. **$B = \{x \mid 6 \leq x < 20, \quad x = 2k, \quad k \in N^{+}\}$ B kümesinin 2 elemanlı alt küme sayısı kaçtır?**

What is the number of subsets with 2 elements of set B?

Yanıt / The Answer is 21

8. **$A = \{x \mid -3 < x \leq 4, \quad x \in Z\}$ A kümesinin 3 elemanlı alt küme sayısı kaçtır?**

What is the number of subsets with 3 elements of set A?

Yanıt / The Answer is 35

METROPOL YAYINLARI · METROPOL PUBLICATIONS

9. A = {a, b, c, d, e, f} A **kümesinin en çok iki elemanlı kaç alt kümesi vardır?**

What is the number of subsets with at most 2 elements of set A?

Yanıt / The Answer is 22

10. B = {1, 2, 3, 4, 5, 6, 7} B **kümesinin en az beş elemanlı kaç alt kümesi vardır?**

What is the number of subsets with at least 5 elements of set B?

Yanıt / The Answer is 29

11. A = {x | 3< x < 9, x ∈ N} **A kümesinin en çok iki elemanlı kaç alt kümesi vardır?**

What is the number of subsets with at most 2 elements of this set?

Yanıt / The Answer is 16

12. A = {x | –5 ≤ x < 3, x ∈ Z} **A kümesinin en az altı elemanlı kaç alt kümesi vardır?**

What is the number of subsets with at least 6 elements of set A?

Yanıt / The Answer is 37

13. **A={1, 2, 3, 4, 5, 6} A kümesinin 3 elemanlı alt kümelerinin kaç tanesinde 5 elemanı bulunmaz?**

How many of 3-element subsets of set A does not have element 5 in it?

Yanıt / The Answer is 10

14. **A = {a, b, c, d, e, f, g, h} A kümesinin 3 elmanlı alt kümelerinin kaç tanesinde c elemanı bulunur?**

How many of 3-element subsets of set A have element c in it?

Yanıt / The Answer is 21

15. **B = {1, 3, 5, 7, 9, 11, 13} B kümesinin 3 elemanlı alt kümelerinin kaç tanesinde 9 elemanı bulunur, 5 elemanı bulunmaz?**

How many of 3-element subsets of set B have element 9 but does not have element 5 in it?

Yanıt / The Answer is 10

16. **B = {a, b, c, d, e, f, g, h}** B **kümesinin 3 elemanlı alt kümelerinin kaç tanesinde a elemanı bulunur, e elamanı bulunmaz?**

How many of 3-element subsets of set B have element a but does not have element e in it?

Yanıt / The Answer is 15

METROPOL YAYINLARI · METROPOL PUBLICATIONS

17. $A \subset E$,

$n(A) = 7$, $n(A') = 6$

$\Rightarrow$ **n(E) = ?**

Yanıt / The Answer is 13

18. $A \subset E$,

$n(A) = 8$, $n(E) = 15$

$\Rightarrow$ **n(A′) = ?**

Yanıt / The Answer is 7

19. $A \subset E$, $B \subset E$,

$n(A) = 12$, $n(A') = 15$, $n(B) = 17$

$\Rightarrow$ **n(B′) = ?**

Yanıt / The Answer is 10

20. $A \subset E$,

$n(E) = 28$, $n(A') = 5x - 3$, $n(A) = 3x - 1$

$\Rightarrow$ **x = ?**

Yanıt / The Answer is 4

21. $A \subset E$, $B \subset E$,

$n(A) + n(B') = 17$,

$n(B) + n(A') = 23$

$\Rightarrow$ **n(E) = ?**

Yanıt / The Answer is 20

22. $A \subset E$, $B \subset E$, $C \subset E$,

$n(A) + n(B') = 13$,

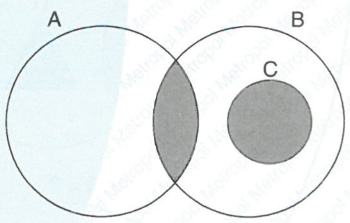
$n(B) + n(A') = 15$,

$n(C) = 5$

$\Rightarrow$ **n(C′) = ?**

Yanıt / The Answer is 9

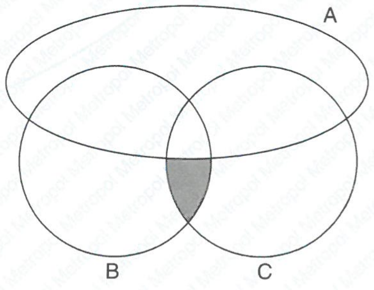
23.



$\Rightarrow$ **TA(SA) = ?**

Yanıt / The Answer is $(A \cap B) \cup C$

24.



$\Rightarrow$ **TA(SA) = ?**

Yanıt / The Answer is $(B \cap C) \setminus A$

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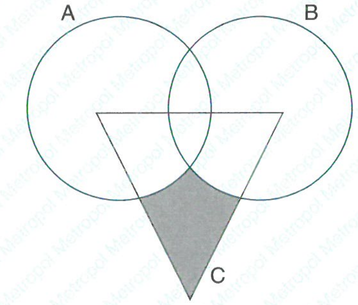
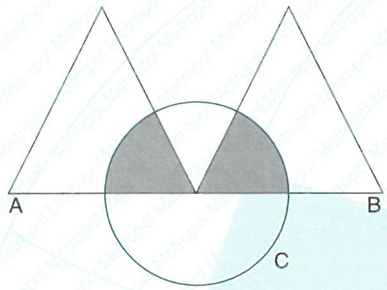
25.



⇒ **TA(SA) = ?**

Yanıt / The Answer is C\(A∪B)

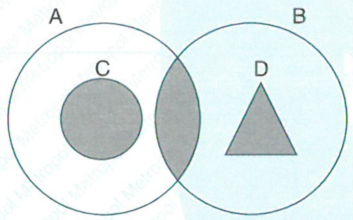
26.



⇒ **TA(SA) = ?**

Yanıt / The Answer is (A∩C)∪(B∩C)

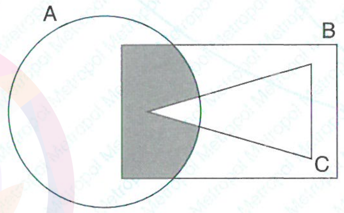
27.



⇒ **TA(SA) = ?**

Yanıt / The Answer is (A∩B)∪(C∪D)

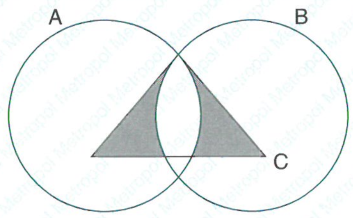
28.



⇒ **TA(SA) = ?**

Yanıt / The Answer is (A∩B)\C

29.



⇒ **TA(SA) = ?**

Yanıt / The Answer is C\(A∩B)

30. n(A\B) = 3,

n(B\A) = 4,

n(A ∩ B) = 2

⇒ **n(A ∪ B) = ?**

Yanıt / The Answer is 9

31. n(A ∪ B) = 15,

n(B\A) = 3

⇒ **n(A) = ?**

Yanıt / The Answer is 12

32. n(A) = 7,

n(B) = 8,

n(A ∩ B) = 3

⇒ **n(A ∪ B) = ?**

Yanıt / The Answer is 12

METROPOL YAYINLARI · METROPOL PUBLICATIONS

33. $n(A \cup B) = 18$,

$n(A) = 10$,

$n(B) = 13$

$\Rightarrow$ **$n(A \cap B) = ?$**

Yanıt / The Answer is 5

34. $n(A \cup B) = 24$,

$n(B \backslash A) = 7$,

$n(A \backslash B) = 10$

$\Rightarrow$ **$n(A \cap B) = ?$**

Yanıt / The Answer is 7

35. $n(A \cap B) = x - 1$,

$n(A \backslash B) = 3$,

$n(B \backslash A) = 5$,

$n(A \cup B) = 20$

$\Rightarrow$ **$x = ?$**

Yanıt / The Answer is 13

36. $n(A - B) = 13$,

$n(A \cup B) = 40$

$\Rightarrow$ **$n(B) = ?$**

Yanıt / The Answer is 27

37. $n(A \cap B') = 7$,

$n(B \cap A') = 3$,

$n(A \cap B) = 5$

$\Rightarrow$ **$n(A \cup B) = ?$**

Yanıt / The Answer is 15

38. $n(A \cap B) = 2$,

$n(A \cup B) = 10$,

$n(B \cap A') = 5$

$\Rightarrow$ **$n(A \cap B') = ?$**

Yanıt / The Answer is 3

39. $n(A \cap B') = 5$,

$n(B \cap A') = 6$,

$n(A' \cup B')' = 3$

$\Rightarrow$ **$n(A \cup B) = ?$**

Yanıt / The Answer is 14

40. $n(A \cap B) = 3$,

$n(A) = 8$,

$n(B) = 10$

$\Rightarrow$ **$n(A \cup B) = ?$**

Yanıt / The Answer is 15

METROPOL YAYINLARI - METROPOL PUBLICATIONS

41. $n(A \cap B) = 2$,
$n(A) = 2x + 4$,
$n(B) = x + 6$,
$n(A \cup B) = 4x - 2$
$\Rightarrow$ **$n(B) = ?$**

Yanıt / The Answer is 16

42. $n(A) = 3 \cdot n(B)$,
$n(A - B) = 16$,
$n(A \cap B) = 5$
$\Rightarrow$ **$n(B - A) = ?$**

Yanıt / The Answer is 2

43. $n(A \setminus B) = 5$,
$n(B \setminus A) = 12$,
$n(B) = 2 \cdot (A)$
$\Rightarrow$ **$n(A \cup B) = ?$**

Yanıt / The Answer is 19

44. $n(A \cap B) = 4$,
$n(A \cup B) = 20$,
$n(A) = 3 \cdot n(B)$
$\Rightarrow$ **$n(B) = ?$**

Yanıt / The Answer is 6

45. $n(A) = 10$,
$n(B) = 7$,
$n(A \cup B) = 15$
$\Rightarrow$ **$n(A \cap B) = ?$**

Yanıt / The Answer is 2

46. $n(A) = 8$,
$n(A \cap B) = 3$,
$n(A \cup B) = 16$
$\Rightarrow$ **$n(B) = ?$**

Yanıt / The Answer is 11

47. $B \subset A$,
$n(A) = 13$,
$n(B) = 10$
$\Rightarrow$ **$n(A \cup B) + n(A \cap B) = ?$**

Yanıt / The Answer is 23

48. $n(A) = 7$,
$n(B) = 8$,
$n(A \cap B) = 3$
$\Rightarrow$ **$n(A \setminus B) + n(B \setminus A) = ?$**

Yanıt / The Answer is 9

METROPOL YAYINLARI · METROPOL PUBLICATIONS

49. $n(A \cup B) = 18$,

$n(A \setminus B) = 4$,

$n(B \cap A') = 7$

$\Rightarrow$ **$n(A \cap B) = ?$**

Yanıt / The Answer is 7

50. $n(A \cup B) = 13$,

$n(A \cap B) = 6$,

$n(A) - n(B) = 1$

$\Rightarrow$ **$n(B - A) = ?$**

Yanıt / The Answer is 3

51. $n(B \setminus A) = n(A \setminus B) + 8$,

$n(B \setminus A) + n(A \setminus B) = n(A \cap B)$,

$n(A \cup B) = 32$

$\Rightarrow$ **$n(A) = ?$**

Yanıt / The Answer is 20

52. $A = [-2, 5]$, $B = [1,7]$

$\Rightarrow$ **$A \cap B = ?$**

Yanıt / The Answer is [1, 5]

53. $A = [-3, 4)$, $B = (2, 7)$

$\Rightarrow$ **$A \cup B = ?$**

Yanıt / The Answer is [–3, 7)

54. $A = (-5, 3]$, $B = [-1, 5)$

$\Rightarrow$ **$A \setminus B = ?$**

Yanıt / The Answer is (–5, –1)

55. $A = (-5, 2]$, $B = [-1, 7]$

$\Rightarrow$ **$B \setminus A = ?$**

Yanıt / The Answer is (2, 7]

56. $A = \{x \mid x < 70,\ x = 2k,\ k \in N^+\}$,

$B = \{x \mid x \leq 60,\ x = 3k,\ k \in N^+\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

Yanıt / The Answer is 10

METROPOL YAYINLARI · METROPOL PUBLICATIONS

57. $A = \{x \mid 13 < x < 80, \quad x = 3k, \quad k \in N\}$,

$B = \{x \mid 5 < x < 60, \quad x = 4k, \quad k \in N\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

Yanıt / The Answer is 3

58. $A = \{x \mid 15 \leq x < 53, \quad x = 2k, \quad k \in N\}$,

$B = \{x \mid 7 < x \leq 48, \quad x = 3k, \quad k \in N\}$

$\Rightarrow$ **$n(A \cup B) = ?$**

Yanıt / The Answer is 27

59. $A = \{x \mid 21 < x \leq 90, \quad x = 3k, \quad k \in N\}$,

$B = \{x \mid 10 \leq x < 80, \quad x = 5k, \quad k \in N\}$

$\Rightarrow$ **$n(A \cup B) = ?$**

Yanıt / The Answer is 33

60. $A = \{x \mid 18 \leq x \leq 72, \quad x = 3k, \quad k \in N\}$,

$B = \{x \mid 12 \leq x < 60, \quad x = 2k, \quad k \in N\}$

$\Rightarrow$ **$n(B \setminus A) = ?$**

Yanıt / The Answer is 17

61. $A = \{x \mid 13 \leq x \leq 65, \quad x = 5k, \quad k \in N\}$,

$B = \{x \mid 21 < x < 93, \quad x = 2k, \quad k \in N\}$

$\Rightarrow$ **$n(A \setminus B) = ?$**

Yanıt / The Answer is 7

62. 17 kişilik bir sınıfta Türkçe bilmeyen yoktur. İngilizce bilen 8 kişi, Farsça bilen 12 kişi, her üç dili de bilen 5 kişi varsa yalnız Türkçe bilen kaç kişidir?

In a class of 17 people, there are no one who doesn't know turkish language, 8 people know english language, 12 people know persian language. If 5 people know both of these languages, how many people know only turkish language?

Yanıt / The Answer is 2

63. 15 kişilik bir sınıfta yalnız Fransızca bilen 5, yalnız İnglizce bilen 7, her iki dili de bilen 2 kişi varsa Fransızca ve İngilizce bilmeyen kaç kişi vardır?

In a class of 15 people, 5 people know only french language, 7 people know only english language. If 2 people khow both of these languages, how many people don't know either language?

Yanıt / The Answer is 1

64. Bir sınıfta futbol veya voleyboldan sadece birini oynayan 12 öğrenci, her ikisini oynayan 4 öğrenci vardır. İkisini de 7 sporcu varsa sınıfta kaç kişi vardır?

Among people of a sport club, 12 people play only one of sports volleyball or soccer and 4 people play both of these sports. If 7 people don't play either of these sports, what is the total number of players of this club?

Yanıt / The Answer is 23

METROPOL YAYINLARI · METROPOL PUBLICATIONS

1. A= {a, b, {c, d}, e, f}

Buna göre aşağıdakilerinden hangisi yanlıştır?

Accordingly, which one of the followings is wrong?

A) a ∈ A B) {c, d} ∈ A C) e ∈ A D) f ∈ A E) c ∈ A

2. B = {1, 2, 3, {7, 6, 5}, 4}

Buna göre aşağıdakilerinden hangisi yanlıştır?

Accordingly, which one of the followings is wrong?

A) {1} ⊂ B B) {2, 3, 4 } ⊂ B C) {7, 6, 5 } ⊂ B D) {3} ⊂ B E) {1, 4} ⊂ B

3. A = {1, 2}, 3, 4, 5}

B = {1, 2, 3, a, b, c}

Buna göre aşağıdakilerinden hangisi yanlıştır?

Accordingly, which one of the followings is wrong?

A) {1, 2} ⊂ B B) {1, 2} ∈ A C) {3, 4} ⊂ A D) n (B) = 6 E) n (A) = 5

4. A= {a, b, c, d},

B= {a, b,{c, d}}

Buna göre aşağıdakilerinden hangisi yanlıştır?

Accordingly, which one of the followings is wrong?

A) n(A) > n(B) B) {c, d} ∈ A C) a ∈ A D) b ∈ B E) {{c, d} ⊂ B

METROPOL YAYINLARI · METROPOL PUBLICATIONS

5. A = { x: 2^x < 11, x ∈ N} ⇒ **n(A) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

6. A = {(x, y) : x, y ∈ N ve (and) x + y ≤ 3}

⇒ **n(A) = ?**

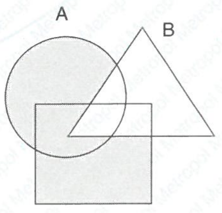
A) 6 B) 7 C) 8 D) 9 E) 10

7. A = { x: x^3 ≤ 75, x ∈ N}

⇒ **n(A) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

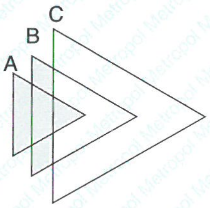
8.



⇒ **Taralı bölgeler /** The Shaded Regions **= ?**

A) (A\B)∪C B) (A∩B)∪C C) (A∪C)\B D) (A\B)∩C E) (A∪C)∩B

9.

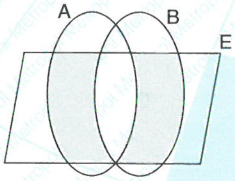


⇒ **Taralı bölgeler / The Shaded Regions = ?**

A) $(A \cup B) \setminus C$ B) $(A \setminus C) \cup B$ C) $A \cup (C \cap B)$

D) $A \cup (B \setminus C)$ E) $(A \cup C) \cap B$

10.



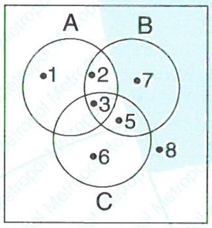
⇒ **Taralı bölgeler / The Shaded Regions = ?**

A) $[(A \setminus B) \cup (B \setminus A)] \cap E$ B) $(A \cup B) \cap E$

C) $(A \cap E) \cup (B \cap E)$ D) $E \setminus (A \cap B)$

E) $[(A \setminus B) \cap (B \setminus A)] \cap E$

11.



⇒ **$[(A' \cup B) - C] = ?$**

A) {3, 7, 8} B) {2, 5, 6} C) {3, 5, 7}

D) {2, 5, 7} E) {2, 7, 8}

12. A = {a, b, c},

$A \cup B$ = {a, b, c, d, e, f},

$A \cap B$ = {a, c} ⇒ **B = ?**

A) {a, b, c} B) {a, c, d, e, f} C) {a, c, f}

D) {d, e, f, b} E) {a, d, e, f}

13. $A \cap B$ = {1, 2, 3},

$A \cap C$ = {2, 3, 4, 5}

⇒ **$A \cap (B \cup C) = ?$**

A) {1, 2, 3, 4, 5} B) {4, 5} C) {2, 3}

D) {1, 4, 5} E) {2, 5}

14. $A \cup B$ = {1, 2, 3, 4},

$A \cup C$ = {2, 3, 4, 5}

⇒ **$A \cup (B \cap C) = ?$**

A) {1, 5} B) {1, 2, 3} C) {2, 3, 4}

D) {2, 5, 7} E) {2, 7, 8}

15. **$[(B - A) \cap (A \cup B')] = ?$**

A) E B) $A \cap B$ C) A

D) B E) Ø

16. $A \cap B \neq \varnothing$

⇒ **$(A \cup \varnothing) \cap (A \cup A) \cap (A' \cup B) = ?$**

A) $A \cup B$ B) $A \cap B$ C) A

D) B E) E

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	C	E	B	C	E	B	C
9	10	11	12	13	14	15	16
D	A	E	B	A	C	E	B

METROPOL YAYINLARI · METROPOL PUBLICATIONS

1. $n(A \setminus B) = 4$,
$n(B) = 7$
$\Rightarrow$ **$n(A \cup B) = ?$**
A) 8 B) 9 C) 10 D) 11 E) 121

2. $n(B \cap A') = 7$,
$n(A \cap B') = 8$,
$n(A) = 12$
$\Rightarrow$ **$n(A \cup B) = ?$**
A) 15 B) 16 C) 17 D) 18 E) 19

3. $A \cup B \neq E$,
$n(A \cap B) = 3$,
$n(A') + n(B') = 25$,
$n(A' \cup B') = 15$
$\Rightarrow$ **$n(A \cup B) = ?$**
A) 6 B) 7 C) 8 D) 9 E) 10

4. $n(A - B) = 5$,
$n(B - A) = 3 \cdot n(A \cap B)$,
$n(A) = 13$,
$\Rightarrow$ **$n(A \cup B) = ?$**
A) 37 B) 38 C) 39 D) 40 E) 41

METROPOL YAYINLARI · METROPOL PUBLICATIONS

5. $n(A \cup B) = 57$,
$n(A - B) = 20$,
$n(A \cap B) = 10$
$\Rightarrow$ **$n(B - A) = ?$**
A) 25 B) 27 C) 29 D) 31 E) 33

6. $n(A \cup B) = 15$,
$n(A \cap B) = 5$,
$n(A) = 10$
$\Rightarrow$ **$n(A - B) - n(B - A) = ?$**
A) 0 B) 2 C) 3 D) 5 E) 10

7. $E = \{x: 1 \leq x \leq 11, x \in N\}$,
$A \cap B = \{2, 4, 6\}$,
$A \cap C = \{1, 3, 7, 9\}$
$\Rightarrow$ **$[A \cap (B \cup C)]' = ?$**
A) {5, 8} B) {10, 11} C) {5, 8, 9} D) {8, 11} E) {5, 8, 10, 11}

8. $n(A - B) = 2 \cdot n(A \cap B)$,
$n(B - A) = 3 \cdot n(A)$,
$n(A \cup B) = 48$
$\Rightarrow$ **$n(A \cap B) = ?$**
A) 1 B) 2 C) 3 D) 4 E) 5

9. n(A) = 12,

n(B) = 10

$\Rightarrow$ **min[n(A – (B – A′))] = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

10. A ∪ B = [–2, 10),

A ∪ C = (3, 14]

$\Rightarrow$ **A ∪ (B \ C′) = ?**

A) [3, 14] B) [–2, 14] C) [0, 10) D) (3, 10) E) [10, 14]

11. n(A) = 2,

n(B) = 7,

n(C) = 11

$\Rightarrow$ **min(n(A ∪ B ∪ C)) = ?**

A) 9 B) 10 C) 11 D) 12 E) 13

12. n(A) = 6,

n(A ∩ B) = 4

$\Rightarrow$ **min(n(B)) = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

13. A = {x : 11 ≤ x ≤ 400, x = 3k, k ∈ Z^+},

B = { y : y < 200, y = 8m, m ∈ N}

$\Rightarrow$ **n(A ∪ B) = ?**

A) 127 B) 132 C) 141 D) 144 E) 147

14. A = {x : |x – 3| ≤ 39, x = 2k, k ∈ Z},

B = {x : |x – 9| ≤ 36, x = 3k, k ∈ Z}

$\Rightarrow$ **n(A ∪ B) = ?**

A) 42 B) 47 C) 51 D) 53 E) 57

15. A – B = {x: 1 ≤ x ≤ 5, x ∈ Z},

A ∩ B = {x: 6 ≤ x ≤ 9, x ∈ Z}

$\Rightarrow$ **n(A) = ?**

A) 9 B) 10 C) 11 D) 12 E) 13

16. A ∩ B = {x: 2 ≤ x ≤ 4, x ∈ Z},

A – B = {x: 5 ≤ x ≤ 7, x ∈ Z},

A ∪ B = {x: 1 ≤ x ≤ 7, x ∈ Z}

$\Rightarrow$ **B = ?**

A) {3, 4} B) {1, 2, 3, 4} C) {6, 7} D) {2, 3, 4} E) {1, 2, 3}

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	E	C	A	B	A	E	D
9	10	11	12	13	14	15	16
B	D	C	B	E	D	A	B

METROPOL YAYINLARI · METROPOL PUBLICATIONS

1. $n(A) = 2 \cdot n(B)$,
$n(A \cup B) + n(A \cap B) = 18$
$\Rightarrow$ **$n(A \setminus B)$ = ?**

A) 12 B) 13 C) 14 D) 15 E) 16

2. $A \cap C = \varnothing$,
$n(A) = 7$,
$n(B) = n(C) = 9$,
$n(A \cap B) = 2$,
$n(B \cap C) = 3$
$\Rightarrow$ **$n(A \cup B \cup C)$ = ?**

A) 16 B) 17 C) 18 D) 19 E) 20

3. $n(A) + n(A - B) = 32$,
$n(B) = 12$
$\Rightarrow$ **$\max(n(A \cup B))$ = ?**

A) 25 B) 26 C) 27 D) 28 E) 29

4. $2 \cdot n(A - B) = 3 \cdot n(B - A)$,
$n(A \cup B) = 23$
$\Rightarrow$ **$\min(n(B))$ = ?**

A) 9 B) 10 C) 11 D) 12 E) 13

5. $\dfrac{n(A)}{n(A \cap B)} = \dfrac{8}{3}$,
$\dfrac{n(B)}{n(A \cap B)} = \dfrac{5}{4}$
$\Rightarrow$ **$\min(n(A \cup B))$ = ?**

A) 28 B) 32 C) 34 D) 35 E) 36

6. $n(A \cap B)' = 19$,
$n(A \cup B)' = 10$
$\Rightarrow$ **$n(A - B) + n(B - A)$ = ?**

A) 7 B) 9 C) 11 D) 13 E) 15

7. $n(A \cup B) = 56$,
$\dfrac{n(A)}{7} = \dfrac{n(A \cap B)}{3} = \dfrac{n(B)}{10}$
$\Rightarrow$ **$n(A \cap B)$ = ?**

A) 8 B) 9 C) 10 D) 11 E) 12

8. $n(A \cup B) = 29$,
$n(A \cap B) = 3$,
$n(A) = n(B)$
$\Rightarrow$ **$n(B - A)$ = ?**

A) 13 B) 14 C) 15 D) 16 E) 17

METROPOL YAYINLARI · METROPOL PUBLICATIONS

9. n(A ∩ B) = 1,
n(A – B) = n(B – A),
n(A ∪ B) = 5
⇒ **n(A) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

10. n(A) = 12,
n(B) = 15,
2·n(A – B) = n(B – A)
⇒ **n(A ∩ B) = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

11. n(A) = 4·n(B),
n(A ∩ B) = 3,
n(A ∪ B) = 42
⇒ **n(A – B) = ?**

A) 27 B) 30 C) 33 D) 36 E) 39

12. n(A – B) = 4,
n(B – A) = 6,
n(A ∪ B) = 3·n(A ∩ B)
⇒ **n(A) = ?**

A) 7 B) 9 C) 11 D) 13 E) 15

13. n(A′) = 12,
n(B) = 9 ,
n(A′ ∩ B′) = 5
⇒ **n(A ∩ B) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

14. n(A) = 3·n(A ∩ B),
n(B) = 2·n(A – B) – 3,
n(A ∪ B) = 39
⇒ **n(A) = ?**

A) 17 B) 18 C) 20 D) 21 E) 22

15. n(B) = n(A – B)
$n(A \cap B) = \frac{2}{5} \cdot n(B)$,
n(A ∪ B) = 30 ⇒ **n(A ∩ B) = ?**

A) 2 B) 4 C) 6 D) 8 E) 10

16. n(A ∪ B) = 44,
n(A – B) = 2·n(B – A) = 3·n(A ∩ B)
⇒ **n(A – B) = ?**

A) 18 B) 20 C) 22 D) 24 E) 26

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	E	D	C	D	B	E	A
9	10	11	12	13	14	15	16
C	D	C	B	B	D	C	D

1. $A = \{ x \mid |x + 4| < 5 ,\ x \in Z\}$

$B = \{ x \mid -1 \leq x < 4 ,\ x \in Z\}$

$\Rightarrow$ **n(A) + n(B) = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

2. $A = \{ x \mid |x| < 6 ,\ x \in Z\}$,

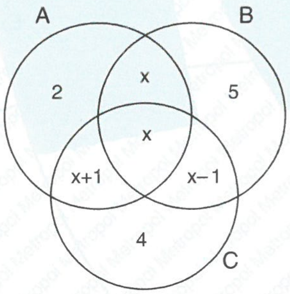
$B = \{ x \mid |x - 1| = 4 ,\ x \in Z\}$

$\Rightarrow$ **n(A ∩ B) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $n(A \cap B \cap C) = 3$

$\Rightarrow$ **n(A ∩ C) + n(B ∩ C) = ?**



A) 3

B) 6

C) 9

D) 12

E) 15

4. **(A′∩ B) ∪ (A ∩ B) = ?**

A) A ∪ B B) B C) A′ D) B′ E) ∅

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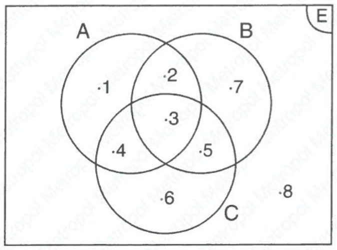
5.



$\Rightarrow$ **B ∩ (A′∪C) = ?**

A) {1,2} B) {2, 3} C) {3, 5, 7} D) {4, 6} E) {5, 7}

6. **[A\ (B ∩ C)] ∩ (A ∩ B ∩ C) = ?**

A) A ∩ B ∩ C B) A C) A′ D) A ∪ B ∪ C E) ∅

7. $n(A \cup B) = 3 \cdot n(A \cap B) = 2 \cdot n(A \setminus B)$,

$n(B \setminus A) = 4$

$\Rightarrow$ **n(B′ ∩ A) = ?**

A) 4 B) 8 C) 12 D) 16 E) 20

8. $n(A) + n(B') = 15$,

$n(A') + n(B) = 13$

$\Rightarrow$ **n(E) = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

9. $A = [-5, 7]$,
$B = [-6, 8]$
$\Rightarrow$ **$A \cap B$ = ?**

A) $[-5, 8]$ B) $[-5, 7]$ C) $(-6, 8]$
D) $[-5, 8)$ E) $[-6, 7)$

10. $A \subset B \subset C$,
$n(C \setminus B) = 8$,
$n(A) = 2$
$\Rightarrow$ **$\min(n(A \cup B \cup C))$ = ?**

A) 8 B) 9 C) 10 D) 11 E) 12

11. $A = \{ x \mid 0 \leq x \leq 48 , \quad x = 2k , \ k \in Z\}$
$B = \{ x \mid -10 \leq x < 30 , \quad x = 3k , \ k \in Z\}$
$\Rightarrow$ **$n(A \cap B)$ = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

12. $A \cap B \neq \varnothing$,
$n(A) = 10$,
$n(B) = 15$
$\Rightarrow$ **$\min(n(A \cup B)) + \max(n(A \cup B))$ = ?**

A) 20 B) 25 C) 29 D) 35 E) 39

13. $3 \cdot n(A \setminus B) = 4 \cdot n(A \cap B) = 8 \cdot n(B \setminus A)$
$\Rightarrow$ **$\min(n(A \cup B))$ = ?**

A) 12 B) 17 C) 24 D) 28 E) 36

14. $n(A \cup B) = 100$,
$A = \%60$,
$B = \%70$
$\Rightarrow$ **$n(A \cap B)$ = ?**

A) 10 B) 20 C) 30 D) 40 E) 50

15. $A = [-8, 12]$,
$B = [-9, 14]$
$\Rightarrow$ **$A' \cap B$ = ?**

A) $[-9, -8) \cup (12, 14]$ B) $[-8, 14]$
C) $(-9, 12)$ D) $(-\infty, 8)$
E) $(12, \infty)$

16. $A = \{ x \mid -11 < x < 92 , \quad x = 3k , \ k \in Z^{+}\}$,
$B = \{ x \mid -8 < x < 100 , \quad x = 9k , \ k \in Z^{+}\}$
$\Rightarrow$ **$n(A \cap B)$ = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

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1	2	3	4	5	6	7	8
E	B	D	B	C	E	C	E
9	10	11	12	13	14	15	16
B	C	A	E	B	C	A	A

1. $n(A) = 1,\ n(B) = 3,\ n(C) = 5$

$\Rightarrow$ **$\min(n(A \cup B \cup C)) = ?$**

A) 1 B) 2 C) 5 D) 8 E) 9

2. $n(A \setminus B) = 2x - 5,$
$n(A \cap B) = x + 1,$
$n(A' \cap B) = x$

$\Rightarrow$ **$\min(n(A \cup B)) = ?$**

A) 7 B) 8 C) 9 D) 10 E) 11

3. $n(A \setminus B) = 12,\ n(A \cap B) = 6,\ n(E) = 38$

$\Rightarrow$ **$n(A') = ?$**

A) 12 B) 16 C) 20 D) 23 E) 25

4. $n(A \setminus B) = x^2,\ n(A \cap B) = 1,$
$n(B \setminus A) = 2x,\ n(A \cup B) = 16$

$\Rightarrow$ **$x = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

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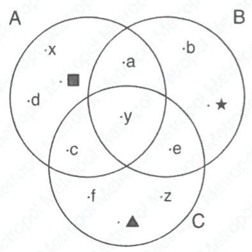
5.



$\Rightarrow$ **$[(A \cup B) \setminus C'] = ?$**

A) {x, ■, d} B) {a, y} C) {a, b, ★}
D) {c, e, y} E) {f, ▲, z}

6. $A = \{ x \mid 10 < x < 100,\ x = 2k,\ x \in Z\}$
$B = \{ x \mid 20 < x < 120,\ x = 4k,\ x \in Z\}$

$\Rightarrow$ **$n(A \setminus B) = ?$**

A) 23 B) 25 C) 28 D) 34 E) 35

7. $n(A \cap B) \neq \varnothing,\ A \not\subset B,$
$n(A) = 9,$
$n(B) = 12$

$\Rightarrow$ **$\min(n(A \cup B)) + \max((n(A \cup B)) = ?$**

A) 30 B) 31 C) 32 D) 33 E) 34

8. **$(A' \cap B) \cup (B \setminus A') = ?$**

A) A B) A′ C) B D) B′ E) A∪B

9. $n(A) + n(B) = 24$,

$n(B') + n(A') = 12$

$\Rightarrow$ **n(E) = ?**

A) 10 B) 15 C) 17 D) 18 E) 24

10. $n(A) = 2x + 6$,

$n(A \cap B) = x + 2$,

$n(B' \cap A) = 8$,

$n(B \setminus A) = 2 \cdot n(A \setminus B)$

$\Rightarrow$ **n(A ∪ B) = ?**

A) 8 B) 12 C) 14 D) 16 E) 30

11. $A = \{ (a, b) \mid a \cdot b = 14,\ a, b \in N^+\}$

$\Rightarrow$ **n(A) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

12. $n(A) = 2 \cdot n(B)$

$n(A \cup B) + n(A \cap B) = 36$

$\Rightarrow$ **n(B) = ?**

A) 6 B) 9 C) 12 D) 15 E) 18

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13. $n(A \cup B) = 44$,

$n(A \cap B) = 6$,

$n(A) = 4 \cdot n(B)$

$\Rightarrow$ **n(B) = ?**

A) 6 B) 10 C) 12 D) 16 E) 20

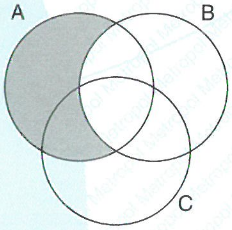
14. $n(A \cup B) - n(A \cap B) = 12$,

$n(A) + n(B) = 30$

$\Rightarrow$ **n(A ∩ B) = ?**

A) 6 B) 9 C) 12 D) 15 E) 18

15.



$\Rightarrow$ **Taralı bölgeler /** The Shaded Regions **= ?**

A) $A' \setminus (B \cup C)$ B) $A \cap (B' \cap C)$

C) $(B \cap C) \setminus A$ D) $A \setminus (B \cup C)$

E) $A \setminus B$

16. $A = [-8, 18]$,

$B = [-7, 20]$

$\Rightarrow$ **A ∪ B = ?**

A) $[-8, 20]$ B) $(-8, 18]$ C) $(-7, 20)$

D) $[-7, 18]$ E) $[-7, 20)$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	B	C	C	D	B	D	C
9	10	11	12	13	14	15	16
D	E	D	C	B	B	E	A

1. **A = {3, 4, 5, 6, 7, 8, 9} kümesinin alt kümelerinin kaç tanesinde en az bir tek sayı bulunur?**

How many of the subsets of the set A = {3, 4, 5, 6, 7, 8, 9} involve at least one odd number?

A) 20 B) 60 C) 80 D) 100 E)120

2. **A = {x: |x − 2| ≤ 1, x ∈ Z} kümesinin kaç tane özalt kümesi vardır?**

How many proper subsets does the set A = {x: |x − 2| ≤ 1, x ∈ Z} have ?

A) 7 B) 8 C) 15 D) 16 E) 31

3. **3 elemanlı alt kümelerinin sayısı 20 olan bir kümenin 4 elemanlı alt küme sayısı kaçtır?**

If the number of subsets which has 3 elements, of a set is 20, what is the number of the subsets which has 4 elements, of that set?

A) 6 B) 9 C) 12 D) 15 E) 18

4. **A = {a, b, c, d, e, f} kümesinin 4 elemanlı alt kümelerinin kaç tanesinde c elemanı bulunur?**

How many of the subsets which has 4 elements, of set A = {a, b, c, d, e, f} have c as a member?

A) 8 B) 10 C) 12 D) 14 E) 16

5. **n(E) = 16,**
n(A\B) = 8,
n(A′∩ B′) = 3 olduğuna göre B kümesinin alt küme sayısı kaçtır?

Accordingly, what is the number of subsets of set B?

A) 8 B) 16 C) 32 D) 64 E) 128

6. **n(E) = 20,**
n(A′) = 8,
n(A\B) = 7 olduğuna göre A′ ∩ B kümesinin özalt küme sayısı kaçtır?

Accordingly, what is the number of subsets of A∩B?

A) 7 B) 15 C) 31 D) 63 E) 127

7. **n(A\B) = 8,**
n(A ∩ B) = 5,
n(A ∪ B) = 20 olduğuna göre A ∩ B kümesinin 3 elemanlı alt küme sayısı kaçtır?

Accordingly, what is the number of 3-element subsets of the set A′∩B?

A) 21 B) 27 C) 30 D) 35 E) 42

8. **A = { x | x ∈ Z , 10 < x < 25} , B = { y | y ∈ Z , 1 < y < 20} ise A ∩ B kümesinin 3 elemanlı alt kümelerinin kaç tanesinde asal sayı bulunmaz?**

How many of the subsets which has 3 members, of the set A ∩ B do not have any prime numbers?

A) 5 B) 10 C) 15 D) 20 E) 25

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9. A ∪ B'nin alt kümelerinin sayısı 256 ve A ∩ B'nin alt kümelerinin sayısı 32'dir. A\B'nin alt küme sayısı 4 ise B kümesinin eleman sayısı kaçtır?

The number of the subsets of the set A ∪ B is 256 and the number of the subsets of the set A ∩ B is 32, if number of subsets of A\B is 4, then n(B)=?

A) 1 B) 3 C) 4 D) 5 E) 6

10. A ∩ B = {a, b, c}, B ∩ C = {c, d, e} ise B\(A ∪ C)′ kümesinin özalt küme sayısı kaçtır?

If A ∩ B = {a, b, c} and B ∩ C = {c, d, e}, what is the number of the proper subsets of the set B\(A ∪ C)′?

A) 7 B) 15 C) 31 D) 63 E) 127

11. n(A ∩ B) = 3,
n(A′) + n(B′) = 25,
n(A′∪ B′) = 15 olduğuna göre A ∪ B kümesinin 2 elemanlı kaç alt kümesi vardır?

Accordingly, what is the number of 2 - element subsets of the set A∪B=?

A) 28 B) 32 C) 36 D) 48 E) 52

12. A\B, B\A ve A kümelerinin alt küme sayıları sırasıyla 8, 16, 32 sayılarıyla orantılıdır. A ∪ B kümesinin eleman sayısı 36 olduğuna göre A ∩ B kümesinin eleman sayısı kaçtır?

The number of the subsets of the sets A\B, B\A and A are proportional to the numbers 8,16,32, respectively.
if the number of elements of A∪B is 36, then n(A ∩ B) = ?

A) 4 B) 5 C) 6 D) 7 E) 8

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13. A kümesinin 2 elemanlı alt kümelerinin sayısı x ve 3 elemanlı alt kümelerinin sayısı y dir. y = 2x olduğuna göre, x kaçtır?

The number of the subsets which has 2 members of the set A is x and the number of the subsets which has 3 members of the set A is y. If y = 2x, then what is the value of x?

A) 8 B) 16 C) 24 D) 28 E) 32

14. A = {x | x ∈ Z , |2x – 3| > 5} olduğuna göre, A′ kümesinin 3 elemanlı kaç alt kümesi vardır?

If A = {x | x ∈ Z , |2x – 3| > 5} , what is the number of subsets which has 3 members of the set A′?

A) 16 B) 18 C) 20 D) 24 E) 28

15. Bir kümenin alt küme sayısı ile özalt küme sayısının çarpımı 240'tır. Bu kümenin 2 elemanlı alt kümelerinin sayısı kaçtır?

The product of the number of subsets of a set and it's proper subsets is 240. What is the number of the subsets which has 2 members of this set?

A) 4 B) 6 C) 8 D) 10 E) 12

16. n(A′) = 9, n(A′ ∪ B′) = 15
olduğuna göre A\B kümesinin özalt küme sayısı kaçtır?

Accordingly, what is the number of the proper subsets of A\B?

A) 7 B) 15 C) 31 D) 63 E) 127

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	A	D	B	C	C	D	B
9	10	11	12	13	14	15	16
E	C	A	E	D	C	B	D

1. $A \cup B = \{a, b, c, d\}$,

$A \cup C = \{a, c, d, e\}$

$\Rightarrow$ **$n(A \cup (B \cap C)) = ?$**

A) 1 B) 2 C) 3 D) 5 E) 7

2. $A \setminus B = \{a, b, c, d\}$,

$A \cap C' = \{a, e, c, f\}$

$\Rightarrow$ **$A \setminus (B \cup C) = ?$**

A) {a, c} B) {a, b, c} C) {a, b, c, d, e} D) {a, b, c, d, e, f} E) $\varnothing$

3. **$[(A' \cap B) \cup (A \cap B)]' = ?$**

A) B B) A C) B′ D) A′ E) $A \cup B$

4. $A = \{x, y, \{x, y\}, \varnothing\}$,

$B = \{x, \varnothing\}$

$\Rightarrow$ **$n(A \setminus B) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

5. $A = \{1, 2, 3, 4, 5\}$,

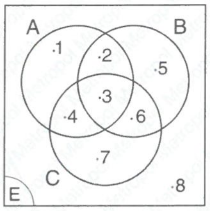
$B = \{2, 3, 4, 6, 8\}$,

$C = \{0, 3, 5, 7\}$

$\Rightarrow$ **$(A \cap B) \cup (A \cap C) = ?$**

A) {2, 3} B) {3, 5} C) {4, 5} D) {2, 3, 5} E) {2, 3, 4, 5}

6. **$B' \setminus (A \cap C) = ?$**



A) {1, 4, 7} B) {1, 7} C) {1, 3} D) {1, 6, 7} E) {1, 7, 8}

7. $A \neq \varnothing$, $B \neq \varnothing$,

$n(A \cup B) = 25$,

$n(A - B) = 5$,

$n(A) + n(B) = 29$

$\Rightarrow$ **$n(B - A) = ?$**

A) 16 B) 15 C) 14 D) 13 E) 11

8. $n(A) + n(B) = 35$,

$n(A) = 18$,

$n(A - B) + n(B - A) = 21$

$\Rightarrow$ **$n(A - B) = ?$**

A) 4 B) 5 C) 6 D) 8 E) 11

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9. $n(A \cap B) = 5$,
$n(B) - n(A) = 3$,
$4 \cdot n(A) = 3 \cdot n(B)$
$\Rightarrow$ **$n(A \cup B) = ?$**
A) 9 B) 14 C) 16 D) 17 E) 18

10. **$[(A' \cap B) \cup B] \cap [(A \cap C) \cup B] = ?$**
A) $C \cup B$ B) $A \cup B$ C) A
D) B E) C

11. $A \subset B \subset C$,
$n(A) = 3$,
$n(B) = 5$,
$n(C) = 9$
$\Rightarrow$ **$n(A \cup B) + n(B \cap C) = ?$**
A) 10 B) 9 C) 8 D) 5 E) 3

12. $n(B) = 11$,
$n(B \setminus A) = 5$,
$n(A \cup B) = 15$
$\Rightarrow$ **$n(A) = ?$**
A) 6 B) 9 C) 10 D) 11 E) 12

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13. $n(A \cup B) = 15$,
$n(A) = 2 \cdot n(A \setminus B)$,
$n(B) = 3 \cdot n(B \setminus A)$
$\Rightarrow$ **$n(A \cap B) = ?$**
A) 2 B) 4 C) 6 D) 8 E) 9

14. $A \neq \varnothing$, $B \neq \varnothing$,
$n(A - B) = x + 5$,
$n(B) = 2x$,
$n(A \cup B) = 8 \Rightarrow$ **$n(A - B) = ?$**
A) 2 B) 3 C) 4 D) 5 E) 6

15. $A \cup B = E$,
$A = \{2, 3, 4, 5\}$,
$B = \{1, 2, 3, 5, 6, 7, 8\}$
$\Rightarrow$ **$n(A' - B') = ?$**
A) 2 B) 3 C) 4 D) 5 E) 6

16. $B \not\subset A$,
$n(A) = 8$,
$n(B) = 4$
$\Rightarrow$ **$\min(n(A \cup B))$ için (for) $n(A \cap B) = ?$**
A) 1 B) 2 C) 3 D) 4 E) 5

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	A	C	B	E	E	A	E
9	10	11	12	13	14	15	16
C	D	A	C	C	E	C	C

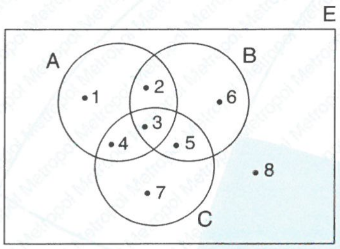
1. $A = \{x \mid -3 \le x \le 6,\ x \in \mathbb{N}\}$,

$B = \{x \mid 1 \le x^2 \le 9,\ x \in \mathbb{Z}\}$

$\Rightarrow$ **n(A) + n(B) = ?**

A) 10 B) 11 C) 12 D) 13 E) 15

2.

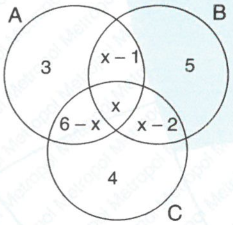


$\Rightarrow$ **$A \cap (B \cup C)' = ?$**

A) {1} B) {1,2} C) {1,8}

D) {2,3,4} E) {1,2,3,4}

3.



$n(A \cup B \cup C) = 25$

$\Rightarrow$ **n(A) = ?**

A) 10 B) 11 C) 12 D) 13 E) 15

4. $A = \{x \mid |x - 2| \le 4,\ x \in \mathbb{Z}\}$,

$B = \{x \mid |x| \le 8,\ x \in \mathbb{N}\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 6 B) 7 C) 8 D) 9 E) 10

5. **$(A \cap B) \cup (A \setminus B) = ?$**

A) A B) B C) A′ D) B′ E) E

6. $n(B) = 3 \cdot n(A)$,

$2 \cdot n(B \setminus A) = 7 \cdot n(A \setminus B)$

$\Rightarrow$ **min(n(B)) = ?**

A) 14 B) 15 C) 16 D) 18 E) 21

7. $4 \cdot n(A \setminus B) = 3 \cdot n(A \cap B) = 10 \cdot n(B \setminus A)$

$\Rightarrow$ **$\min(n(A \cup B)) = ?$**

A) 32 B) 34 C) 36 D) 41 E) 48

8. $A = \{x \mid 20 < x < 200,\ x = 8k,\ k \in \mathbb{Z}\}$,

$B = \{x \mid 25 < x < 250,\ x = 6k,\ k \in \mathbb{N}\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 5 B) 6 C) 7 D) 8 E) 9

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9. $A \cup B = E$,
$n(A \cap B') = 12$, $n(A' \cup B') = 23$
$\Rightarrow$ **$n(A') = ?$**
A) 7 B) 8 C) 9 D) 10 E) 11

10. $A \cup B = E$
$\Rightarrow$ **$(A' \cup B') \cup (A \setminus B') = ?$**
A) A B) B C) A′ D) B′ E) E

11. $A = \{x \mid x < 103,\ x = 3k,\ k \in N^+\}$,
$B = \{x \mid 25 < x < 122,\ x = 5k,\ k \in N^+\}$
$\Rightarrow$ **$n(A \cup B) = ?$**
A) 42 B) 46 C) 48 D) 50 E) 53

12. $3 \cdot n(A) = 2 \cdot (B)$,
$n(A \cup B) + n(A \cap B) = 50$
$\Rightarrow$ **$n(B) = ?$**
A) 16 B) 18 C) 20 D) 24 E) 30

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13. $A = (-3, 4]$, $B = [2, 6)$ $\Rightarrow$ **$A \setminus B = ?$**
A) $(-3, 3)$ B) $(-3, 4)$ C) $(-2, 2)$
D) $(-3, 2)$ E) $(-3, 2]$

14. $A \cup B = E$
$n(A \cup B) = 120$,
$A = \%60$, $B = \%90$
$\Rightarrow$ **$n(A \cap B) = ?$**
A) 40 B) 50 C) 60 D) 70 E) 80

15. $n(E) = 20$, $A \cup B = \%80$,
$A = \%65$, $B = \%40$ $\Rightarrow$ **$n(B \setminus A) = ?$**
A) 3 B) 4 C) 5 D) 6 E) 8

16. $A = [-2, 5]$,
$B = [1, 7]$,
$C = [2, 3]$
$\Rightarrow$ **$(A \cap B) \setminus C = ?$**
A) $[1, 2)$ B) $(3, 5]$ C) $(1, 5]$
D) $[-2, 1) \cup) (5, 7)$ E) $[1, 2) \cup (3, 5]$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	A	D	B	A	B	D	C
9	10	11	12	13	14	15	16
E	E	C	E	D	C	A	E

1. $A \neq \varnothing$, $B \neq \varnothing$, $A \subset B$,

$n(A) + n(B) = 6 \cdot n(B \setminus A) - 1$

$\Rightarrow$ **min(n(A ∩ B)) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

2. $n(A) = 9$, $n(B) = 6$

$\Rightarrow$ **max(n(A ∪ B)) + min(n(A ∪ B)) = ?**

A) 22 B) 24 C) 26 D) 28 E) 30

3. $A = \{x : |x - 1| < 3 ,\ x \in Z\}$

$\Rightarrow$ **n(A) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

4. $A = \{1, 3, 5, 7, 9\}$,

$B = \{x \mid 1 < x < 10,\ x \in Z\}$

$\Rightarrow$ **n(A ∩ B) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

5. $n(A \cap B) = 5$,

$n(A \setminus B) + n(B \setminus A) = 64$

$\Rightarrow$ **n(A ∪ B) = ?**

A) 57 B) 60 C) 63 D) 66 E) 69

6. $n(A) = 9$,

$n(B) = 20$

$\Rightarrow$ **n(A ∪ B) + n(A ∩ B) = ?**

A) 28 B) 29 C) 30 D) 31 E) 32

7. $A \cap B \neq \varnothing$,

$n(A \setminus B) = 4$, $n(B \setminus A) = 5$

$\Rightarrow$ **min((n(A ∪ B)) = ?**

A) 8 B) 9 C) 10 D) 12 E) 14

8. $A \cup B = E$,

$n(A \cup B) = 18$,

$n((A \cap B)') = 16$,

$n(A) = 3 \cdot n(B)$

$\Rightarrow$ **n(B \ A) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

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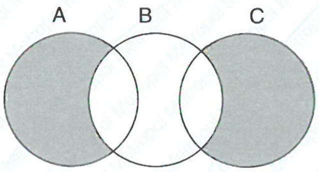
9. $A \not\subset B$,
$n(A \cap B) = 4$,
$n(A \cup B) = 12$
⇒ **max(n(B \ A)) = ?**

A) 4 B) 7 C) 9 D) 12 E) 10

10.



⇒ **Taralı bölgeler / The Shaded Regions = ?**

A) $(A \cup B) \cap C$
B) $(A \cup C) \setminus B$
C) $(B \setminus A) \cup C$
D) $(B \setminus C) \cap A$
E) $(A \cap C) \setminus B$

11. $A \subset B \subset C$,
$n(A) + n(B) + n(C) = 24$
⇒ **max(n(A)) = ?**

A) 3 B) 4 C) 5 D) 6 E) 8

12. $n(E) = 16$,
$n(A' \cap B) = 6$,
$n(A \cap B) = 3$,
$n(A \cap B') = 5$
⇒ **$n(A' \cup B)$ = ?**

A) 16 B) 8 C) 4 D) 2 E) 11

13. $n(A \cup B) = 26$,
$n(A - B) = 2 \cdot n(B - A)$,
$n(A \cap B) = 5$
⇒ **n(A) = ?**

A) 14 B) 16 C) 18 D) 19 E) 20

14. $n(E) = 32$,
$n(A') = 16$,
$n(B) = 12$,
$n(A' \cup B') = 30$ ⇒ **$n(A \cup B)$ = ?**

A) 26 B) 24 C) 22 D) 20 E) 16

15. $n(A) = 3x + 4$,
$n(B) = 6x - 1$,
$n(A \cap B) = x - 2$,
$4 \cdot n(A \cap B) = n(A)$
⇒ **$n(A \cup B)$ = ?**

A) 102 B) 101 C) 90 D) 89 E) 88

16. $A \cup B \cup C = E$,
$n(A \cap B) = \varnothing$,
$n(A \cap C) = \varnothing$,
$n(A) = 8$, $n(B) = 11$, $n(C) = 13$,
$n(B - C) + n(C - B) = 12$
⇒ **n(E) = ?**

A) 26 B) 27 C) 28 D) 29 E) 30

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	B	D	C	E	B	C	B
9	10	11	12	13	14	15	16
B	B	E	E	D	A	B	A

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1. $A = \{1, 2, 3\}$, $A \cup B = \{1, 2, 3, 4, 5\}$,
$A \setminus B = \{1, 2\}$
$\Rightarrow$ **$B = ?$**
A) $\{3, 4\}$ B) $\{4, 5\}$ C) $\{3, 4, 5\}$ D) $\{3, 5\}$ E) $\{1, 2\}$

2. $A = \{x \mid (x + 3)^2 \leq 16, x \in Z\}$,
$B = \{x \mid |x - 1| \leq 5, x \in Z\}$
$\Rightarrow$ **$n(B \setminus A) = ?$**
A) 2 B) 3 C) 4 D) 5 E) 6

3. $A \not\subset B$, $B \not\subset A$,
$n(A \cup B) = 15$, $n(A) = 8$
$\Rightarrow$ **$\max(n(B)) = ?$**
A) 10 B) 11 C) 12 D) 13 E) 14

4. $2 \cdot n(A \setminus B) = 3 \cdot n(A \cap B) = 4 \cdot n(B \setminus A)$
$\Rightarrow$ **$\min(n(A \cup B)) = ?$**
A) 12 B) 13 C) 14 D) 15 E) 16

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5. $n(E) = 25$, $n(A \cap B') = 5$,
$n(A' \cap B) = 6$, $n(A \cap B) = 4$
$\Rightarrow$ **$n(A' \cap B') = ?$**
A) 10 B) 12 C) 13 D) 14 E) 15

6. $n(E) = 17$, $n(A \cap B') = 5$,
$n(A' \cap B') = 4 \Rightarrow$ **$n(B) = ?$**
A) 6 B) 7 C) 8 D) 9 E) 10

7. $A = [2, 4]$, $B = [-4, 3]$
$\Rightarrow$ **$A' \cap B = ?$**
A) $[-4, 2)$ B) $[-4, 2]$ C) $(-4, 2)$ D) $(3, 4)$ E) $(3, 4]$

8. $n(A \cup B) = 42$, $n(A \cap B) = 3$
$n(B) = 2 \cdot n(A) \Rightarrow$ **$n(B \setminus A) = ?$**
A) 22 B) 24 C) 25 D) 26 E) 27

9. $n(A \cap B') = 5,\ n(B \setminus A) = 5,$

$n(A \cup B) = 12$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

10. $B \subset A,\ A - B = \{3, 4\}$

$A = \{1, 2, 3, 4\} \Rightarrow$ **$B = ?$**

A) {1} B) {1, 2} C) {1, 2, 3} D) {1, 3, 4} E) {2, 3, 4}

11. $3 \cdot n(A \setminus B) = 4 \cdot n(A \cap B) = 6 \cdot n(B - A),$

$n(A \cup B) < 87$

$\Rightarrow$ **$\max(n(A \cup B)) = ?$**

A) 63 B) 72 C) 81 D) 90 E) 99

12. $A \cup B = E \Rightarrow$ **$(A' \cup B')' \cup (A \setminus B) = ?$**

A) A B) B C) $A \cap B$ D) A' E) B'

METROPOL YAYINLARI · METROPOL PUBLICATIONS

13. $n(A) + n(B') = 27,$

$n(A') + n(B) = 21$

$\Rightarrow$ **$n(E) = ?$**

A) 22 B) 23 C) 24 D) 25 E) 26

14. $A \not\subset B,\ B \not\subset A,$

$n(A \cup B) = 23,\ n(A) = 11,$

$A \cap B \neq \varnothing$

$\Rightarrow$ **$\min(n(B)) = ?$**

A) 12 B) 13 C) 14 D) 15 E) 16

15. $n(A) = 13,\ n(B \setminus A) = 5$

$\Rightarrow$ **$n(A \cup B) = ?$**

A) 15 B) 16 C) 17 D) 18 E) 19

16. $A \cap B \neq \varnothing$

$n(A) = 3 \cdot n(B)$

$n(A \setminus B) = 6 \cdot n(B \setminus A)$

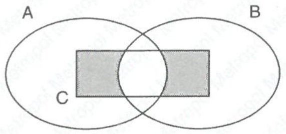
$\Rightarrow$ **$\min(n(B)) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	D	E	B	A	C	A	E
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	B	C	A	C	B	D	E

1.



$\Rightarrow$ **Taralı bölgeler / The Shaded Regions = ?**

A) $C \setminus A$ B) $(A \cap C) \cup B$ C) $C \setminus (A \cap B)$ D) $(B \cup C) \setminus A$ E) $(A \cup B) \setminus C$

2. $A \cap B \neq \varnothing$,
$n(A) = 8$,
$n(B) = 4$
$\Rightarrow$ **min(n(A ∪ B)) için (for) n(A ∩ B) = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

3. $n(A) = 2 \cdot n(B)$,
$n(A \cap B) = 4$,
$n(A \cup B) = 11$
$\Rightarrow$ **n(A – B) = ?**

A) 2 B) 4 C) 6 D) 8 E) 10

4. $A = \left\{x \mid k = \frac{3x+3}{x},\ x, k \in Z\right\}$
$B = \left\{y \mid m = \frac{3y+3}{y}, y,\ m \in Z\right\}$
$\Rightarrow$ **n(A ∪ B) = ?**

A) 2 B) 4 C) 6 D) 7 E) 8

5. $A = \{ x \mid 1 \le x \le 500,\ \ x = 4k,\ \ k \in N\}$,
$B = \{ y \mid 1 \le y \le 600,\ \ y = 6k,\ \ k \in N\}$
$\Rightarrow$ **n(A ∪ B) = ?**

A) 160 B) 163 C) 180 D) 184 E) 190

6. $A = \{ x \mid 1 \le x \le 50,\ \ x \in Z\}$,
$B = \{ y \mid 1 \le y \le 50,\ \ y \in Z\}$,
$\Rightarrow$ **n(A – B) = ?**

A) 50 B) 45 C) 30 D) 15 E) 0

7. $A = \{ x \mid 0 < x \le 10,\ \ x \in Z^+\}$,
$B = \{ y \mid y = 2k,\ 0 < k \le 10,\ \ k \in Z^+\}$
$\Rightarrow$ **n(A ∩ B) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

8. $A = \left\{x \mid k = \frac{3x+7}{x-1},\ x, k \in Z\right\}$
$\Rightarrow$ **n(A) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

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9. $A = \{ x \mid 1 < x \leq 6, \quad x \in N\}$,
$B = \{ y \mid |1 - 2y| \leq 9, \; y \in Z\}$,
$\Rightarrow$ **$n(A \cap B) = ?$**

A) 3 B) 4 C) 5 D) 6 E) 7

10. $A = \{ x \mid 8 < x \leq 20, \quad x \in N\}$,
$B = \{ x \mid x = 3k, \; 3 \leq k \leq 6, \; k \in Z\}$
$\Rightarrow$ **$n(A \cap B) = ?$**

A) 2 B) 3 C) 4 D) 5 E) 6

11. $A = \{ x \mid x = 4k, \; x \leq 100, \quad k \in Z^+\}$,
$B = \{ x \mid x = 10k, \; x \leq 100, \quad k \in Z^+\}$
$\Rightarrow$ **$n(A \cup B) = ?$**

A) 10 B) 15 C) 20 D) 25 E) 30

12. $n(A) + n(B') = 20$,
$n(A') + n(B) = 14$
$\Rightarrow$ **$n(E) = ?$**

A) 7 B) 11 C) 13 D) 17 E) 19

13. $n(A) = 2x - 3$,
$n(B) = 3x + 4$,
$n(A \cup B) = 3x + 7$,
$n(A \cap B) \neq \varnothing$
$\Rightarrow$ **$\min(x) = ?$**

A) 3 B) 4 C) 5 D) 6 E) 7

14. $n(A) = 5 \cdot n(B)$,
$n(A \cup B) + n(A \cap B) = 30$
$\Rightarrow$ **$n(A) = ?$**

A) 5 B) 10 C) 15 D) 20 E) 25

15. $n(A \cap B) = 11$,
$n(A \cup B) = 29$
$\Rightarrow$ **$\min(n(A)) = ?$**

A) 10 B) 11 C) 18 D) 29 E) 40

16. $n(A') = 10$
$n(B') = 11 \quad \Rightarrow$ **$n((A \cup B')') = ?$**
$n(A \cap B') = 5$

A) 4 B) 5 C) 6 D) 7 E) 8

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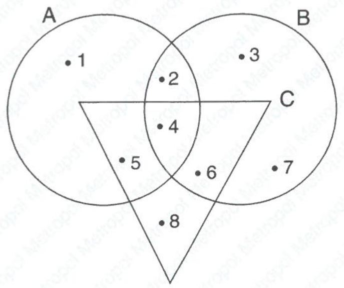
YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	B	C	B	D	E	B	E
9	10	11	12	13	14	15	16
B	C	E	D	B	E	B	A

1.



$\Rightarrow$ **(A ∪ B′) ∩ C = ?**

A) {4} B) {4, 5} C) {4, 5, 8} D) {4, 8} E) {4, 5, 6, 8}

2. n(A′ ∪ B′) = 20, n(A ∪ B)′ = 8,
A ∩ B ≠ ∅
$\Rightarrow$ **min[n(A) + n(B)] = ?**

A) 8 B) 9 C) 12 D) 13 E) 14

3. n(A\B) = 35,
n(B) = 4·n(A ∩ B),
n(A) = 2·n(B \ A)
$\Rightarrow$ **n(A ∪ B) = ?**

A) 30 B) 42 C) 56 D) 63 E) 68

4. n(A) = 6, n(B \ A) = 3,
n(A′) = 8, n(B′) = 7
$\Rightarrow$ **n(A ∩ B) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

5. n(A \ B) = 3·n(B) = 6·n(A ∩ B),
n(A ∪ B) = 32
$\Rightarrow$ **n(B) = ?**

A) 4 B) 5 C) 6 D) 8 E) 9

6. **(A′ \ B′) ∩ (A′ \ B) = ?**

A) A B) B C) A′ D) B′ E) ∅

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7. n(A′) = 15, n(B′) = 17,
n(A) + n(B) = 16
$\Rightarrow$ **n(E) = ?**

A) 24 B) 26 C) 28 D) 30 E) 32

8. n(A) = 3·n(B), n(A ∩ B) = 6,
n(A ∪ B) = 50
$\Rightarrow$ **n(A \ B) = ?**

A) 13 B) 26 C) 32 D) 36 E) 39

9. $A = \{x \mid 21 \le x < 78,\ x = 3k,\ k \in N\}$,
$B = \{x \mid 30 < x \le 90,\ x = 5k,\ k \in N\}$

$\Rightarrow$ **n(A ∩ B) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

10. $A = \{x \mid 13 \le x \le 75,\ x = 3k,\ k \in N\}$,
$B = \{x \mid 24 \le x < 82,\ x = 2k,\ k \in N\}$

$\Rightarrow$ **n(A \ B) = ?**

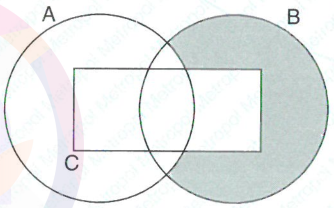
A) 12 B) 14 C) 16 D) 18 E) 21

11. $A = \{x \mid 18 \le x < 81,\ x = 3k,\ k \in N\}$,
$B = \{x \mid 3 < x \le 60,\ x = 4k,\ k \in N\}$

$\Rightarrow$ **n(A ∪ B) = ?**

A) 28 B) 30 C) 31 D) 32 E) 36

12.



$\Rightarrow$ **Taralı bölge / The Shaded Region = ?**

A) (A ∪ C) \ B B) C \ (A ∩ B) C) B \ A
D) (A ∩ B) \ C E) B \ (A ∪ C)

13. $A = \{x \mid 32 \le x < 202,\ x = 4k,\ k \in N\}$,
$B = \{x \mid 47 < x < 243,\ x = 6k,\ k \in N\}$

$\Rightarrow$ **n(A ∩ B′) = ?**

A) 24 B) 29 C) 30 D) 31 E) 32

14. **[A′ ∩ (B ∩ A)]′ = ?**

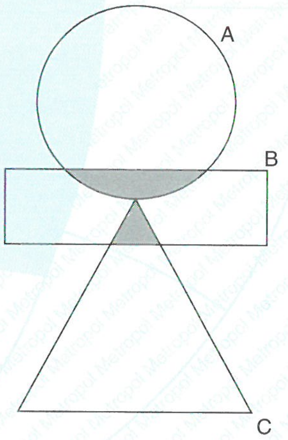
A) ∅ B) A C) B D) A′ E) E

15. $n(A \cup B) = 17$, $n(A \cap B) = 4$,
$n(B) + 3 = 2 \cdot n(A)$

$\Rightarrow$ **n(B) = ?**

A) 9 B) 11 C) 12 D) 13 E) 15

16.



$\Rightarrow$ **Taralı bölge / The Shaded Region = ?**

A) B ∩ (A ∪ C) B) (A ∩ B) \ C C) (B ∩ C) ∪ A
D) (B ∩ A) \ C E) (B ∩ C) \ A

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	E	D	D	D	E	A	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	A	D	E	C	E	D	A

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1. $A \cap B = \{1, 2\}$, $B \cap C = \{2, 3, 5, 6\}$

$\Rightarrow$ **$n[B \cap (A \cup C)] = ?$**

A) 5 B) 6 C) 7 D) 8 E) 10

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

2. $n(A) = 8$, $n(A \cap B) = 4$

$n(A \cup B) = 19$

$\Rightarrow$ **$n(B) = ?$**

A) 12 B) 13 C) 14 D) 15 E) 16

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

3. $A \subset B \subset C \subset D$

$\Rightarrow$ **$[(A \cup B) \cap (C \setminus B)] \cup D = ?$**

A) C B) $\varnothing$ C) $B \cup C$ D) $A \setminus C$ E) D

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

4. $A = \{\{1\}, 1, 2, \{1,\{2\}\}, \{3\}\}$

Aşağıdakilerden hangisi yanlıştır?

Which one of the followings is wrong?

A) $\{1, \{3\}\} \subset A$ B) $\{1\} \in A$ C) $\{1, 2\} \in A$

D) $\{2, \{3\}\} \subset A$ E) $\{1\} \subset A$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

5. $2 \cdot n(A) = 3 \cdot n(B) = 7 \cdot n(A \cap B)$

$\Rightarrow$ **$\min[n(A \cap B)] = ?$**

A) 4 B) 6 C) 8 D) 12 E) 15

[ATATÜRK ÜNİVERSİTESİ – YÖS 2017]

6. $A = \{x : |x| < 4, x \in R\}$,

$B = \{x : -2 \leq x \leq 7, x \in Z\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 4 B) 5 C) 6 D) 7 E) 8

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

7. $A = \{a, b, 3, \{3\}, \square, \{3, \square\}, \{a\}\}$

$B = \{\{2\}, \Delta, a, \{b\}, 3, \square\}$

$\Rightarrow$ **$[n(A \setminus B) + n(A \cup B)] = ?$**

A) 10 B) 11 C) 12 D) 13 E) 14

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2017]

8. $n(A \cup B) = 29$,

$n(A) - n(B) = \dfrac{n(A \setminus B)}{4}$,

$n(A \cap B) = 8$

$\Rightarrow$ **$n(A) = ?$**

A) 10 B) 12 C) 16 D) 18 E) 20

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

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9. $n(P \cup R) = 20$,

$n(P - R) = 6$,

$n(P) = n(R)$

$\Rightarrow$ **$n(P \cap R) = ?$**

A) 4 B) 5 C) 6 D) 7 E) 8

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

10. $A = \{3, 4, \{5\}, \{6, 7\}, \varnothing\}$

Aşağıdakilerden hangisi <u>yanlıştır</u>?

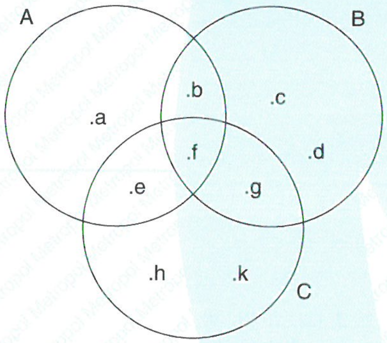
Which one of the followings are <u>wrong</u>?

A) $3 \in A$ B) $\{4\} \subset A$ C) $\{\{6, 7\}\} \subset A$

D) $\{\varnothing\} \subset A$ E) $\{5\} \notin A$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

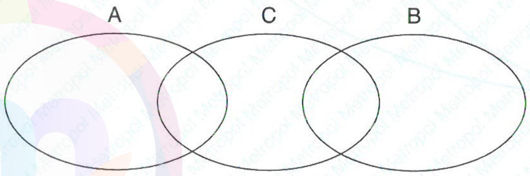
11.



$\Rightarrow$ **$(A \setminus C) \cap (A \setminus B) = ?$**

A) {f} B) {b} C) {e} D) {a} E) {g}

12.



$n(A) = 30$, $n(B) = 12$, $n(C) = 24$,

$n(C \setminus B) = 20$, $n(A \cup C) = 45$

$\Rightarrow$ **$n(C \setminus A) + n(B \setminus C) = ?$**

A) 18 B) 22 C) 23 D) 25 E) 32

METROPOL YAYINLARI · METROPOL PUBLICATIONS

13. $A = \{n : n < 75,\ n = 3k,\ k \in Z^+\}$,

$B = \{n : n < 100,\ n = 4k,\ k \in Z^+\}$

$\Rightarrow$ **$n(A \cup B) = ?$**

A) 40 B) 42 C) 43 D) 45 E) 48

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

14. $n(A - B) = 3 \cdot n(A \cap B,)$

$n(A \cup B) = 17$,

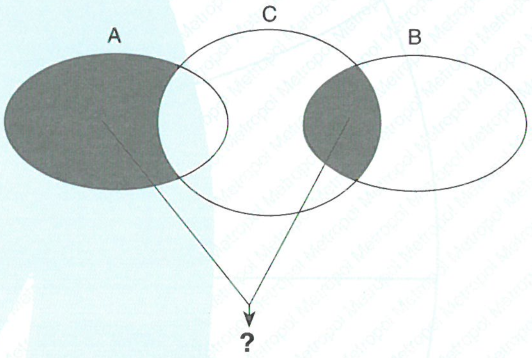
$n(B) = 8$

$\Rightarrow$ **$n(B - A) = ?$**

A) 3 B) 4 C) 5 D) 6 E) 7

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2014]

15.



A) $(A \cup B) \cap C$ B) $A \setminus (C \setminus B)$

C) $(A \setminus C) \cup (C \cap B)$ D) $A \setminus (B \cap C)$

E) $(A \setminus B) \cup C$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2014]

16. $A = \{x : -2 < x < 3,\ x \in Z\}$,

$B = \{y : -3 < y < 2,\ y \in Z^+\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

[ANKARA ÜNİVERSİTESİ – YÖS 2013]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	D	E	C	B	C	E	E
9	10	11	12	13	14	15	16
E	E	D	C	B	C	C	C

BÖLÜM CHAPTER 12

TARİHSEL NOT / HISTORICAL NOTE

Grigori Perelman [1977 -]

Birçok kişi tarafından Dünya'nın yaşayan en zeki insanı olarak kabul edilen Grigori Perelman 2000 yılında Clay Matematik Enstitüsünün o güne kadar çözülemeyen ve "Bin Yılın Soruları" olarak görülen milenyum sorularından 1 milyon dolar ödüllü "Poincare Varsayımı" nı 2002 yılında çözmüş ve 2006 yılında Fields ödülüne layık görülmüştür.
Fakat Grigori Perelman hem soru başına koyulan 1 milyon dolarlık ödülü hem de hak ettiği Fields ödülünü reddetmiş ve tarihe bu şekilde geçmiş ilk matematikçidir.

He is regarded as the smartest living person in the world by a lot of people, at the year of 2002 he solved one of the so called "Millennium Questions" that was introduced by Clay Institute, questions which were not resolved until that day and was awarded 1 million dollars in year 2000; he deserved the Fields award in 2006.
However, Grigori Perelman not only rejected the fields award, but also he rejected the 1 million dollars award which was awarded per each question, so his name was written as the first mathematician who didn't accept this award.

BAĞINTI
RELATION

Bu bölüm 16 alıştırma sorusu ve 16 test sorusu içermektedir.
This chapter includes 16 exercise questions and 16 test questions.

BÖLÜM / CHAPTER 12

BAĞINTI / RELATION

- Bağıntı / Relation .... 475 - 480

BÖLÜM 12 CHAPTER

BAĞINTI RELATION

Alıştırmalar / Exercises

Bağıntı / Relation

1. $(x + 2, 7) = (5, y - 2) \Rightarrow$ **$x \cdot y = ?$**

Yanıt / The Answer is 27

2. $(4a + 3, 2b - 4) = (2a + 7, 3b - 1) \Rightarrow$ **$a - b = ?$**

Yanıt / The Answer is 5

3. $(2^{x+2}, x + y + 5) = (8, 2y - 3) \Rightarrow$ **$y = ?$**

Yanıt / The Answer is 9

4. $(x + 1, x + y - 3, y + 2m) = (2, 3, -7) \Rightarrow$ **$m = ?$**

Yanıt / The Answer is – 6

5. $A \times B = \{(a,3), (a,4), (a,5), (b,3), (b,4), (b,5)\}$

$\Rightarrow$ **$B = ?$**

Yanıt / The Answer is {3,4,5}

6. $n[A \times (B \setminus C)] = 15$,

$n(B \setminus C) = 3$

$\Rightarrow$ **$n(A \times A) = ?$**

Yanıt / The Answer is 25

7. $n(B \cup C) = 7$,

$n[(A \times B) \cup (A \times C)] = 35 \Rightarrow$ **$n(A) = ?$**

Yanıt / The Answer is 5

8. $A = \{ x \mid 2 \le x < 5, x \in Z\}$,

$B = \{ x \mid -5 < x < 3, x \in Z\}$

$\Rightarrow$ **$n(A \times B) = ?$**

Yanıt / The Answer is 21

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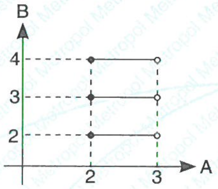
9. $A = \{x \mid 2 \le x < 3,\ x \in R\}$

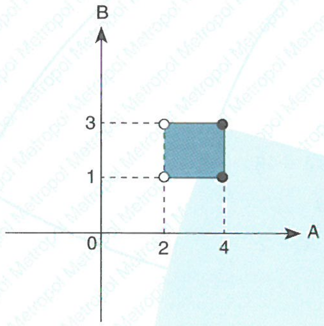
$B = \{x \mid 1 < y \le 4,\ x \in Z\}$

A x B nin grafiği / graph = ?

Yanıt / The Answer is



10.



⇒ **A = ?**

Yanıt / The Answer is (2,4]

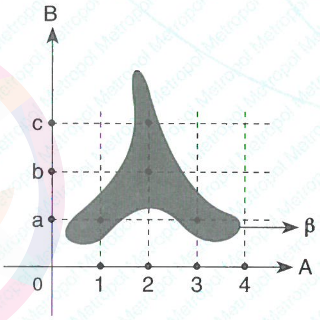
11. $a,b \in R^+$,

$\beta(a, b) = \dfrac{2a - b}{b}$,

$\beta(3, 2) = \beta(6, m) \quad \Rightarrow \quad$ **m = ?**

Yanıt / The Answer is 4

12.



⇒ **β = ?**

Yanıt / The Answer is = {(1,a), (2,b), (2,c), (3,a)}

13. $A \cup B = \{1, 2, 3, 4\}$,

$C = \{m,n,p\}$

⇒ **n[(C x A)∪(C x B)] = ?**

Yanıt / The Answer is 12

14. $A = \{1, 2, 3, 4\}$,

$B = \{3, 4, 5\}$,

$C = \{4, 5, 6\}$

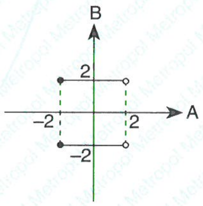
⇒ **n(B x A) + n(B x C) = ?**

Yanıt / The Answer is 21

15. $A = [-2, 2)$, $\quad B = \{-2, 2\}$

⇒ **A x B nin grafiği / Graph of A x B = ?**

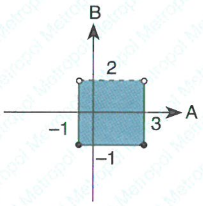
Yanıt / The Answer is



16. $A = [-1,3]$, $\quad B = [-1,2)$

⇒ **A x B nin grafiği / Graph of A x B = ?**

Yanıt / The Answer is



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1. $(3^{2x+1}, 2y) = (3^{y}, x-7) \Rightarrow$ **x + y = ?**

A) –8 B) –7 C) –5 D) 7 E) 8

2. $n[(AxB) \cap (AxC)] = 13 \Rightarrow$ **max[n(A)] = ?**

A) 1 B) 5 C) 7 D) 9 E) 13

3. $A = \{x \mid -1 \le x < 4,\ x \in Z\}$,

$n(A \times B) = 15 \Rightarrow$ **n(B) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

4. $A \cap B = \{1, 3\}$, $C = \{a, b, c, d\}$

$\Rightarrow$ **n[(C x A)∩(C x B)] = ?**

A) 4 B) 6 C) 8 D) 10 E) 12

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5. $A = \{ x : -1 < x < 3,\ x \in Z\}$,

$B = \{ y : 2 < y < 7,\ y \in Z\}$

$\Rightarrow$ **n(A x B) = ?**

A) 12 B) 14 C) 16 D) 18 E) 20

6. $A = \{1,2,3,4\}$,

$B = \{2,3,4,5,6,7,8,9\}$,

$C = \{3,4,5,10\}$

$\Rightarrow$ **n[(A x B)∩(A x C)] = ?**

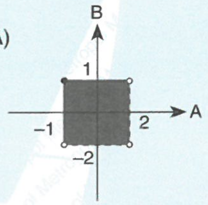
A) 10 B) 12 C) 16 D) 18 E) 20

7. **$A = [-1,2)$, $B = \{y \mid -2 < y \le 1,\ y \in R\}$ ise /** if

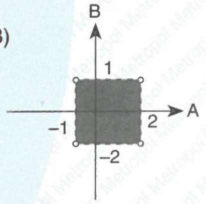
A x B nin grafiği aşağıdakilerden hangisidir?

Which one of the followings is the graph of AxB?

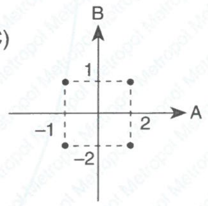
A)



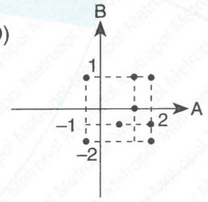
B)



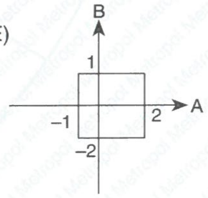
C)



D)



E)



8. $A = \{ x \mid -5 \le x < 3,\ x \in Z\}$,

$n(AxB) = 48 \Rightarrow$ **n(B) = ?**

A) 2 B) 4 C) 6 D) 8 E) 12

9. $A = \{x \mid 2 < x \leq 5,\ x \in R\}$,
$B = \{y \mid 2 < y < 4,\ y \in R\}$
$\Rightarrow$ **max(A(A x B)) = ?**

A) 4 B) 6 C) 8 D) 9 E) 10

10. AxB = { (a, b), (a, c) (b, b), (b, c), (c, b), (c, c)}
$\Rightarrow$ **A∩B′ = ?**

A) ∅ B) {a} C) {b} D) {c} E) {a, b}

11. AxB = {(1, 2), (1, 3), (2, 2), (2, 3), (3, 2), (3, 3)}
$\Rightarrow$ **A∩B = ?**

A) {1, 2} B) {1, 3} C) {2, 3} D) {2} E) {3}

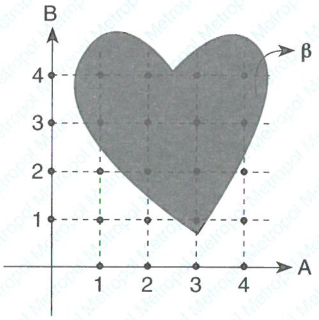
12. n[(A x B)∪(A x C)] = 24,
3 < n(A) < 18 $\Rightarrow$ **max[n(A)] = ?**

A) 4 B) 6 C) 8 D) 9 E) 12

13. A x B = {(1, a), (1, b), (2, a), (2, b)},
B x C = {(a, 3), (a, 4), (a, 5), (b, 3), (b, 4),(b, 5)}
$\Rightarrow$ **n(A x B x C) = ?**

A) 10 B) 12 C) 16 D) 18 E) 24

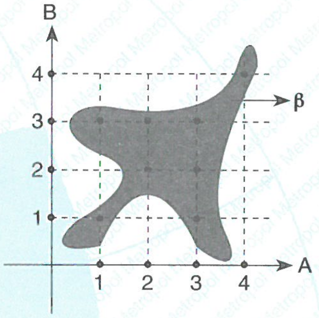
14.



$\Rightarrow$ **n(β) = ?**

A) 8 B) 9 C) 10 D) 11 E) 16

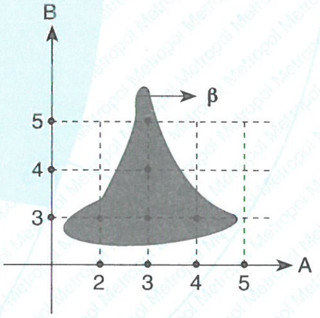
15.



$\Rightarrow$ **n(β) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

16.



$\Rightarrow$ **n(β^{-1}) = ?**

A) {(2, 3), (3, 3), (4, 3), (3, 4), (3, 5)}
B) {(3, 2), (3, 3), (4, 3), (3, 4), (5, 3)}
C) {(3, 2), (3, 3), (3, 4), (4, 3), (3, 5)}
D) {(2, 3), (3, 3), (4, 3), (4, 4), (5, 5)}
E) {(3, 2), (4, 2), (5, 2), (2, 5), (3, 5)}

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	E	C	C	A	B	A	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
B	B	C	E	B	D	E	B

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BÖLÜM 13
CHAPTER 13

TARİHSEL NOT / HISTORICAL NOTE

Bessel Friedrich Wilhelm [1784 – 1846]

Alman gökbilimci ve matematikçi, Bessel fonksiyonları ortaya çıkarmakla matematiğe büyük katkıda bulunmuştur. Bessel fonksiyonları, diferansiyel denklemlerin elde edilmesinde ve muhtemelen temel fonksiyonlardan sonra mühendislik ve fizik alanında en sık kullanılan fonksiyonlardır.

German astronomer and mathematician who made a major contribution to mathematics in the development of what are now called Bessel functions. These functions, satisfy certain differential equations, and probably are the most commonly occurring functions in physics and engineering after the elementary functions.

FONKSİYONLAR
FUNCTIONS

Bu bölüm 128 alıştırma sorusu, 264 test sorusu, 16 YÖS sorusu içermektedir.

This chapter includes 128 exercise questions, 264 test questions, and 16 YÖS questions.

BÖLÜM / CHAPTER 13

FONKSİYONLAR / FUNCTIONS

- Fonksiyonlar / Functions . . . . 481 - 534

BÖLÜM 13 CHAPTER

FONKSİYONLAR
FUNCTIONS

Alıştırmalar / Exercises

Fonksiyonlar / Functions

1. $f = \{(2, 5), (3, 4), (4, -2)\}$

$\Rightarrow$ **$f(3) + f(4) = ?$**

Yanıt / The Answer is 2

---

2. $f = \{(-2, 3), (0, 5), (1, 7), (2, 4)\}$

$\Rightarrow$ **$f(-2) \cdot f(1) = ?$**

Yanıt / The Answer is 21

---

3. $f(x) = |x + 3| + |x - 4|$

$\Rightarrow$ **$f(3) = ?$**

Yanıt / The Answer is 7

---

4. $f(x) = 2^{x+2} - 13$

$\Rightarrow$ **$f(2) = ?$**

Yanıt / The Answer is 3

---

5. $f(x) = \sqrt{x^2 + x + 4} \Rightarrow$ **$f(3) = ?$**

Yanıt / The Answer is 4

---

6. $f(x) = \dfrac{3x+5}{x-1} \Rightarrow$ **$f(5) = ?$**

Yanıt / The Answer is 5

---

7. $f(x) = 4x - 3 \Rightarrow$ **$f(5) - f(2) = ?$**

Yanıt / The Answer is 12

---

8. $f(x) = 4x + c,$

$f(-2) + f(3) = 20$

$\Rightarrow$ **$c = ?$**

Yanıt / The Answer is 8

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9. $f(x) = x^2 - 4x + 4 \Rightarrow f(\sqrt{3} + 2) = ?$

Yanıt / The Answer is 3

13. $f(x) = \dfrac{x^2 - 2x - 15}{x - 5} \Rightarrow f(13) = ?$

Yanıt / The Answer is 16

10. $f(x) = x^2 + 6x + 9 \Rightarrow f(\sqrt{5} - 3) = ?$

Yanıt / The Answer is 5

14. $f(x) = \dfrac{x^3 - 1}{x^2 + x + 1} \Rightarrow f(23) = ?$

Yanıt / The Answer is 22

11. $f(x) = x^3 + 3x^2 + 3x + 1 \Rightarrow f(\sqrt[3]{4} - 1) = ?$

Yanıt / The Answer is 4

15. $f(x) = 2^{x-1}, \quad f(m) = 32 \Rightarrow m = ?$

Yanıt / The Answer is 6

12. $f(x) = x^3 - 3x^2 + 3x - 1 \Rightarrow f(\sqrt[3]{5} + 1) = ?$

Yanıt / The Answer is 5

16. $f(x) = \dfrac{3x + 4}{2x - 1}, \quad f(a) = 2 \Rightarrow a = ?$

Yanıt / The Answer is 6

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17. $f(x) = x^3 + mx - 4$

$f(2) = f(-1) \Rightarrow$ **m = ?**

Yanıt / The Answer is –3

18. $f(x + 2) = 5x - 2 \Rightarrow$ **f(4) = ?**

Yanıt / The Answer is 8

19. $f(x-1) = \dfrac{4x+5}{2x-1} \Rightarrow$ **f(−1) = ?**

Yanıt / The Answer is –5

20. $f(2x - 3) = 4x + 5 \Rightarrow$ **f(5) = ?**

Yanıt / The Answer is 21

21. $f(2x - 3) = ax + 1,$

$f(5) = 17 \Rightarrow$ **a = ?**

Yanıt / The Answer is 4

22. $f(\sqrt{x} + 2) = x^2 + 2x - 1$

$\Rightarrow$ **f(4) = ?**

Yanıt / The Answer is 23

23. $f(3^x + 1) = 2^{x+2} - 7 \Rightarrow$ **f(28) = ?**

Yanıt / The Answer is 25

24. $f(3x - 1) = 3x^2 - 2x - f(5)$

$\Rightarrow$ **f(5) = ?**

Yanıt / The Answer is 4

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25. $f(x^2+2x)=3(x^2+2x)-5$

$\Rightarrow$ **f(6) = ?**

Yanıt / The Answer is 13

26. $f(3x^2-4x)=2(3x^2-4x)^2+5$

$\Rightarrow$ **f(4) = ?**

Yanıt / The Answer is 37

27. $f\left(\frac{1}{x}\right)=\frac{4x+1}{x} \Rightarrow \mathbf{f(-5)=?}$

Yanıt / The Answer is –1

28. $f\left(\frac{4x-1}{x-2}\right)=x^2-2x+3 \Rightarrow \mathbf{f(3)=?}$

Yanıt / The Answer is 38

29. $f\left(\frac{5x-1}{4x-3}\right)=-x^4+5x^3+7 \Rightarrow \mathbf{f(4)=?}$

Yanıt / The Answer is 11

30. $f\left(\frac{3x-4}{-x+1}\right)=x^3-2x+1 \Rightarrow \mathbf{f(-2)=?}$

Yanıt / The Answer is 5

31. $f\left(\frac{x-1}{2x+1}\right)=\frac{2x+1}{x-1}+3 \Rightarrow \mathbf{f\left(\frac{1}{7}\right)=?}$

Yanıt / The Answer is 10

32. $f(x)=\begin{cases} x+3, & 2\le x \\ x^2-1, & x<2 \end{cases} \Rightarrow \mathbf{f(2)-f(-2)=?}$

Yanıt / The Answer is 2

METROPOL YAYINLARI • METROPOL PUBLICATIONS

33. $f(x)=\begin{cases}3x+\sqrt{x+2}, & 5\le x\\ x^2-\sqrt[3]{x-5}, & x<5\end{cases} \Rightarrow$ **$f(4)+f(7)=?$**

Yanıt / The Answer is 41

34. $f(x-5)=\begin{cases}2x-1, & 0\le x\\ x^2+1, & x<0\end{cases} \Rightarrow$ **$f(-7)\cdot f(1)=?$**

Yanıt / The Answer is 55

35. $f(x)=\begin{cases}3x+2, & 2\le x\\ x-3, & x<2\end{cases} \Rightarrow g(x)=x^2-2 \Rightarrow$ **$f(-2)+g(3)=?$**

Yanıt / The Answer is 2

36. $f(x) = x^2 - 2,$

$g(x) = f(x + 1) + 3x + 4 \quad \Rightarrow \quad$ **$g(2) = ?$**

Yanıt / The Answer is 17

37. $f(m + n) = f(m) + f(n),$

$f(2) = 5 \quad \Rightarrow \quad$ **$f(4) = ?$**

Yanıt / The Answer is 10

38. $f(a + b) = f(a) + f(b),$

$f(3) = 7 \quad \Rightarrow \quad$ **$f(9) = ?$**

Yanıt / The Answer is 21

39. $f(m\cdot n) = f(m) + f(n),$

$f(3) = -4 \quad \Rightarrow \quad$ **$f(9) = ?$**

Yanıt / The Answer is –8

40. $f(a\cdot b) = f(a) + f(b),$

$f(2) = 3 \quad \Rightarrow \quad$ **$f(8) = ?$**

Yanıt / The Answer is 9

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41. $f(x+1) - f(x) = 2x$,

$f(1) = 5 \Rightarrow$ **$f(3) = ?$**

Yanıt / The Answer is 11

45. $f(x+2) = x + f(x-1)$,

$f(0) = 5 \Rightarrow$ **$f(6) = ?$**

Yanıt / The Answer is 10

42. $f(x) + f(x-1) = x + 1$,

$f(5) = 4 \Rightarrow$ **$f(3) = ?$**

Yanıt / The Answer is 3

46. $f(x+1) = 3x + f(x-1)$,

$f(2) = 5 \Rightarrow$ **$f(8) = ?$**

Yanıt / The Answer is 50

43. $f(2x+1) = f(2x-1) + 3x + 2$,

$f(1) = 2 \Rightarrow$ **$f(5) = ?$**

Yanıt / The Answer is 15

47. $f(2x+1) = 3x + f(2x-1)$,

$f(1) = 2 \Rightarrow$ **$f(21) = ?$**

Yanıt / The Answer is 167

44. $f(x+1) = f(x) + 3$,

$f(25) = 4 \Rightarrow$ **$f(1) = ?$**

Yanıt / The Answer is –68

48. $f(x+1) = x \cdot f(x)$,

$f(1) = 2 \Rightarrow$ **$f(4) = ?$**

Yanıt / The Answer is 12

METROPOL YAYINLARI • METROPOL PUBLICATIONS

49. f birim fonksiyon / identity function, $(f(x) = I(x) = x)$,

$f(x) = (m - 2)x^2 + (2n - 9)x + p + 1$

$\Rightarrow$ **$m + n - p = ?$**

Yanıt / The Answer is 8

50. $f(x) = x$,

$f(x) = (a - 5)x^3 + (2b + 3)x + c - 2$

$\Rightarrow$ **$a \cdot b \cdot c = ?$**

Yanıt / The Answer is –10

51. $f(x) = x$,

$f(3x - 1) = (a - 2)x + b - 5$

$\Rightarrow$ **$a \cdot b = ?$**

Yanıt / The Answer is 20

52. $f(x) = x$,

$f(x^2 - 3x + 4) = (a - 3)x^2 + (b + 2)x + c - 2$

$\Rightarrow$ **$a + b + c = ?$**

Yanıt / The Answer is 5

METROPOL YAYINLARI • METROPOL PUBLICATIONS

53. $f(x) = x$,

$g(3x + f(x - 3)) = 5x + 7$

$\Rightarrow$ **$g(5) = ?$**

Yanıt / The Answer is 17

54. $f(x) = x$,

$f(3a + 5) = f(2a - 3) \Rightarrow$ **$a = ?$**

Yanıt / The Answer is –8

55. $f(x) = (m - 5)x^2 + (n - 4)x + m \cdot n + 5$,

f sabit fonksiyon / constant function $(f(x) = c,\ c \in R)$

$\Rightarrow$ **$f(7) = ?$**

Yanıt / The Answer is 25

56. f sabit fonksiyon / constant function $(f(x) = c,\ c \in R)$,

$f(x) = (a - 2)x^3 + (b - 3)x + a \cdot b - p + 2$,

$f(2) = 5 \Rightarrow$ **$p = ?$**

Yanıt / The Answer is 3

57. $f(x) = c,\ c \in \mathbb{R}$,

$f(x) = (2m - 4)x^2 - (n + 3)x + 2n - m$

$\Rightarrow$ **$f(-13) = ?$**

Yanıt / The Answer is –8

58. $f(x) = c,\ c \in \mathbb{R}$,

$f(x) = 4mx^2 - 8x^2 + (n + 1)x + 3 \cdot m \cdot n$

$\Rightarrow$ **$f(1999) = ?$**

Yanıt / The Answer is –6

59. $f(x) = c,\ c \in \mathbb{R}$,

$f(x) = \dfrac{ax + 5}{4x + 10} \Rightarrow$ **$a = ?$**

Yanıt / The Answer is 2

60. $f(x) = c,\ c \in \mathbb{R}$,

$f(x) = \dfrac{3x + 2}{12x - b} \Rightarrow$ **$b = ?$**

Yanıt / The Answer is –8

61. $f(x) = c,\ c \in \mathbb{R}$,

$f(x) = \dfrac{2x + a + 2}{5x + 2a - 1} \Rightarrow$ **$a = ?$**

Yanıt / The Answer is –12

62. $f = \{(4, 5), (-2, 3), (0, 7)\}$

$\Rightarrow$ **$f(0) + f^{-1}(3) = ?$**

Yanıt / The Answer is 5

63. $f = \{(2, 3), (-1, 4), (-3, -2)\}$

$\Rightarrow$ **$f^{-1}(3) + f^{-1}(4) + f(-3) = ?$**

Yanıt / The Answer is –1

64. $f(x) = 3x - 5 \Rightarrow$ **$f^{-1}(x) = ?$**

Yanıt / The Answer is $\dfrac{x + 5}{3}$

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65. $f(x)=\frac{3x+1}{4} \Rightarrow f^{-1}(x)=?$

Yanıt / The Answer is $\frac{4x-1}{3}$

66. $f:R-\{3\} \rightarrow R-\{2\}$,
$f(x)=\frac{2x-1}{x-3} \Rightarrow f^{-1}(x)=?$

Yanıt / The Answer is $\frac{3x-1}{x-2}$

67. $f:R-\left\{\frac{-1}{3}\right\} \rightarrow R-\left\{\frac{-2}{3}\right\}$,
$f(x)=\frac{-2x+3}{3x+1} \Rightarrow f^{-1}(x)=?$

Yanıt / The Answer is $\frac{-x+3}{3x+2}$

68. $f:R-\left\{\frac{-3}{4}\right\} \rightarrow R-\left\{\frac{1}{2}\right\}$,
$f(x)=\frac{2x}{4x+3} \Rightarrow f^{-1}(x)=?$

Yanıt / The Answer is $\frac{-3x}{4x-2}$

69. $f:R-\left\{\frac{3}{2}\right\} \rightarrow R-\left\{\frac{-1}{2}\right\}$,
$f(x)=\frac{x-1}{3-2x} \Rightarrow f^{-1}(x)=?$

Yanıt / The Answer is $\frac{3x+1}{2x+1}$

70. $f:R-\{-2\} \rightarrow R-\{3\}$,
$f(x)-2=\frac{3x-2}{x+2} \Rightarrow f^{-1}(x)=?$

Yanıt / The Answer is $\frac{-2x+2}{x-5}$

71. $f:[3,\infty) \rightarrow R$,
$f(x)=\sqrt{x-3} \Rightarrow f^{-1}(x)=?$

Yanıt / The Answer is x^2+3

72. $f:R \rightarrow R$,
$f(x)=(x-5)^3-2 \Rightarrow f^{-1}(x)=?$

Yanıt / The Answer is $\sqrt[3]{x+2}+5$

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73. $f : [2, \infty) \rightarrow [3, \infty)$,

$f(x) = (x-2)^2 + 3 \Rightarrow$ **$f^{-1}(x) = ?$**

Yanıt / The Answer is $\sqrt{x-3}+2$

74. $f : [2, \infty) \rightarrow [1, \infty)$,

$f(x) = x^2 - 4x + 5 \Rightarrow$ **$f^{-1}(x) = ?$**

Yanıt / The Answer is $\sqrt{x-1}+2$

75. $f : [-1, \infty) \rightarrow [4, \infty)$,

$f(x) = x^2 + 2x + 5 \Rightarrow$ **$f^{-1}(x) = ?$**

Yanıt / The Answer is $\sqrt{x-4}-1$

76. $f^{-1}(2x-5) = 3x + 1 \Rightarrow$ **$f(4) = ?$**

Yanıt / The Answer is -3

77. $f^{-1}(3x+4) = 2x - 3 \Rightarrow$ **$f(1) = ?$**

Yanıt / The Answer is 10

78. $f^{-1}(x+m) = 3x - 4$,

$f(5) = 7 \Rightarrow$ **$m = ?$**

Yanıt / The Answer is 4

79. $f^{-1}\left(\frac{2x-3}{a}\right) = x - 1$,

$f(4) = 7 \Rightarrow$ **$a = ?$**

Yanıt / The Answer is 1

80. $f(x) = ax + b$,

$f^{-1}(-3) = 0$,

$f^{-1}(9) = 3 \Rightarrow$ **$f(2) = ?$**

Yanıt / The Answer is 5

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81. $f(x) = ax + b$,

$f^{-1}(19) = 5$,

$f^{-1}(7) = 2 \quad \Rightarrow \quad$ **$f(-4) = ?$**

Yanıt / The Answer is –17

---

82. $f(x) = ax + b$,

$f^{-1}(6) = 1$,

$f^{-1}(12) = 4 \quad \Rightarrow \quad$ **$f(0) = ?$**

Yanıt / The Answer is 4

---

83. $m \in Z^+$,

$f(x) = \dfrac{4x+5}{3x-m^2}$,

$f(x) = f^{-1}(x) \quad \Rightarrow \quad$ **$m = ?$**

Yanıt / The Answer is 2

---

84. $f: R - \{4\} \rightarrow R - \{b\}$,

$f(x) = \dfrac{5x-3}{x-4} \quad \Rightarrow \quad$ **$b = ?$**

Yanıt / The Answer is 5

---

85. $f: R - \{a\} \rightarrow R - \{b\}$

$f(x) = \dfrac{6x+1}{2x-8} \quad \Rightarrow \quad$ **$a \cdot b = ?$**

Yanıt / The Answer is 12

---

86. $f(x) = 3x - 1$,

$g(x) = 2x + 3 \quad \Rightarrow \quad$ **$(fog)(x) = ?$**

Yanıt / The Answer is 6x + 8

---

87. $f(x) = 2x - 3 \quad \Rightarrow \quad$ **$(fof)(x) = ?$**

Yanıt / The Answer is 4x – 9

---

88. $f(x) = x - 2$,

$g(x) = 3x + 1 \quad \Rightarrow \quad$ **$(fog^{-1})(x) = ?$**

Yanıt / The Answer is $\dfrac{x-7}{3}$

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89. $f(x)=\dfrac{x+5}{x-3}$,

$g^{-1}(x)=\dfrac{x-3}{2} \Rightarrow$ **(fog)(x) = ?**

Yanıt / The Answer is $\dfrac{x+4}{x}$

---

90. $f(x)=\dfrac{x^2-2}{3}$,

$g(x)=x+1 \Rightarrow$ **(fog)(x) = ?**

Yanıt / The Answer is $\dfrac{x^2+2x-1}{3}$

---

91. $f(x) = 4x - 5$,

$g(x) = 3x + 2 \Rightarrow$ **(gof)(3) = ?**

Yanıt / The Answer is 23

---

92. $f(x) = 3x - 2$,

$g(x) = 2x - 5 \Rightarrow$ **$(fog^{-1})(3)$ = ?**

Yanıt / The Answer is 10

93. $f^{-1}(x + 1) = 2x - 3$,

$g(x + 2) = x \Rightarrow$ **(fog)(3) = ?**

Yanıt / The Answer is 3

---

94. $f(x) = x^2 + 5$,

$g(x) = x - 2$,

$h(x) = 3x + 1 \Rightarrow$ **(fogoh)(1) = ?**

Yanıt / The Answer is 9

---

95. $f(x)=\dfrac{3x+5}{2x-1}$,

$g^{-1}(x)=\dfrac{x+1}{2} \Rightarrow$ **fog(1) = ?**

Yanıt / The Answer is 8

---

96. $f(2x + 3) = 4x - 9 \Rightarrow$ **f(x) = ?**

Yanıt / The Answer is 2x – 15

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97. $f(4x+1)=3x-4 \quad \Rightarrow \quad$ **f(x) = ?**

Yanıt / The Answer is $\frac{3x-19}{4}$

98. $f(x)=x-2$,

$(fog)(x)=4x+3 \quad \Rightarrow \quad$ **g(x) = ?**

Yanıt / The Answer is $4x+5$

99. $g(x)=2x-3$,

$(fog)(x)=3x+1 \quad \Rightarrow \quad$ **f(x) = ?**

Yanıt / The Answer is $\frac{3x+11}{2}$

100. $f(x)=2x+1$,

$(fog)(x)=2x+3 \quad \Rightarrow \quad$ **g(x) = ?**

Yanıt / The Answer is $x+1$

101. $f(x)=4x-3$,

$(fog)(x)=2x+3 \quad \Rightarrow \quad$ **g(x) = ?**

Yanıt / The Answer is $\frac{x+3}{2}$

102. $g(x)=5x+1$,

$(fog)(x)=15x-1 \quad \Rightarrow \quad$ **f(x) = ?**

Yanıt / The Answer is $3x-4$

103. $(fog)(x)=12x-5$,

$g(x)=-2x+5 \quad \Rightarrow \quad$ **f(x) = ?**

Yanıt / The Answer is $-6x+25$

104. $A=\{1, 2, 3, 4\}$

$f=\begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 3 & 2 & 1 \end{pmatrix} \Rightarrow f^{-1}(3)+f(4)=?$

Yanıt / The Answer is 3

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105. $f:A \to A,\ g:A \to A,$

$A = \{a, b, c, d\},$

$f = \begin{pmatrix} a & b & c & d \\ d & c & a & b \end{pmatrix},$

$g = \begin{pmatrix} a & b & c & d \\ c & a & b & d \end{pmatrix} \Rightarrow$ **fog = ?**

Yanıt / The Answer is $\begin{pmatrix} a & b & c & d \\ a & d & c & b \end{pmatrix}$

---

106. $f:A \to A,\ g:A \to A,$

$A = \{1, 2, 3, 4\},$

$f = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 2 & 4 & 1 \end{pmatrix},$

$gof = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 2 & 1 & 3 \end{pmatrix} \Rightarrow$ **g = ?**

Yanıt / The Answer is $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 2 & 4 & 1 \end{pmatrix}$

---

107. $f:A \to A,\ g:A \to A,$

$A = \{a, b, c, d\},$

$f = \begin{pmatrix} a & b & c & d \\ c & a & b & d \end{pmatrix},$

$g = \begin{pmatrix} a & b & c & d \\ d & c & a & b \end{pmatrix} \Rightarrow$ **$g^{-1}of$ = ?**

Yanıt / The Answer is $\begin{pmatrix} a & b & c & d \\ b & c & d & a \end{pmatrix}$

---

108. $f:A \to A,\ g:A \to A,$

$A = \{1, 2, 3, 4\},$

$f = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 1 & 2 & 3 \end{pmatrix},\ g = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 4 & 1 & 2 \end{pmatrix},$

$f = g^{-1}oh \Rightarrow$ **h = ?**

Yanıt / The Answer is $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 3 & 4 & 1 \end{pmatrix}$

---

109. $f(x) = ax + b$ doğrusal fonksiyon / linear function,

$f(1) = 6,$

$f(4) = 12 \Rightarrow$ **f(3) = ?**

Yanıt / The Answer is 10

---

110. f doğrusal fonksiyon / linear function,

$f(-2) = 5,$

$f(2) = 13 \Rightarrow$ **f(1) = ?**

Yanıt / The Answer is 11

---

111. f doğrusal fonksiyon / linear function,

$f(3) = -7,$

$f(-1) = 17 \Rightarrow$ **f(2) = ?**

Yanıt / The Answer is –1

---

112. f doğrusal fonksiyon / linear function,

$f(-3) = -4,$

$f(3) = 14 \Rightarrow$ **f(5) = ?**

Yanıt / The Answer is 20

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113. $f(x) = 3a - 8$, $f(-x) = 4 - a$

f çift fonksiyon / even function $\Rightarrow$ a = ?

If f(x) is an even function, a = ?

Yanıt / The Answer is 3

114. **$f(x) = 2x^2 + (3m - 6)x + 3$ çift fonksiyon ise f(m) = ?**

If f(x) is an even function, f(m) = ?

Yanıt / The Answer is 11

115. $f(-4) = 2m - 13$, $f(4) = 5 - m$

f çift fonksiyon / even function $\Rightarrow$ m = ?

Yanıt / The Answer is 8

116. **$f(x) = -4x^3 + (m - 2)x^2 + 2x$ tek fonksiyon ise f(m) = ?**

If f(x) is an odd function, f(m) = ?

Yanıt / The Answer is –28

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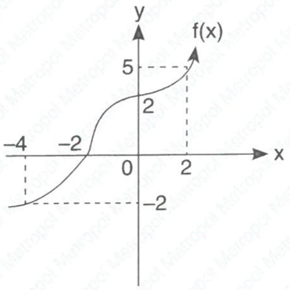
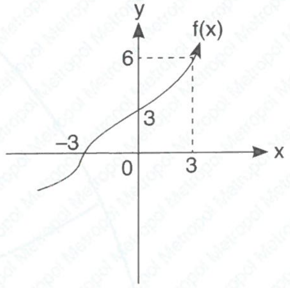
117. $\dfrac{f^{-1}(-2) + f(2)}{f(0)} = ?$



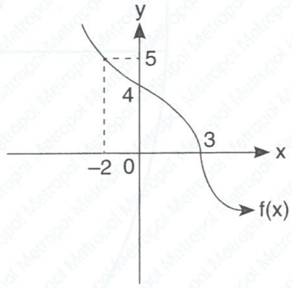
Yanıt / The Answer is $\frac{1}{2}$

118. **(fofof)(–3) = ?**



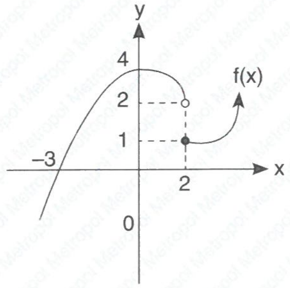
Yanıt / The Answer is 6

119. **$(fof)(3) + f^{-1}(5) = ?$**



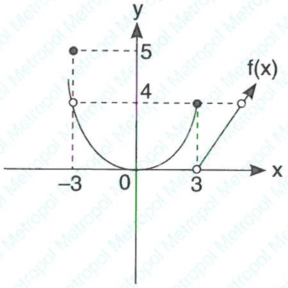
Yanıt / The Answer is 2

120. $\dfrac{f^{-1}(0) + f(2)}{f(0)} = ?$



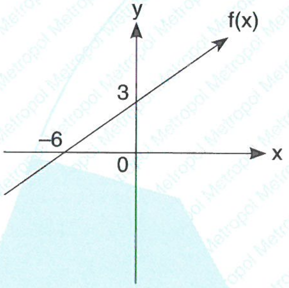
Yanıt / The Answer is $-\frac{1}{2}$

121. $f^{-1}(4) + f(-3) = ?$



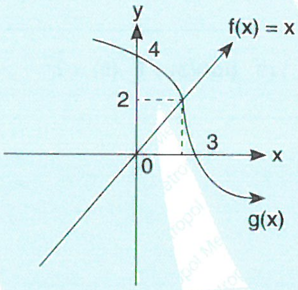
Yanıt / The Answer is 8

122. $f(2) \cdot f^{-1}(2) = ?$



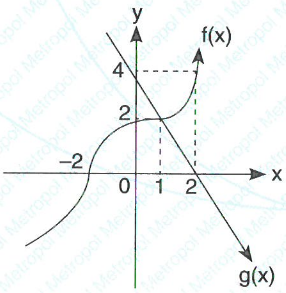
Yanıt / The Answer is –8

123. $\dfrac{g^{-1}(2)+f^{-1}(-1)}{g(0)} = ?$



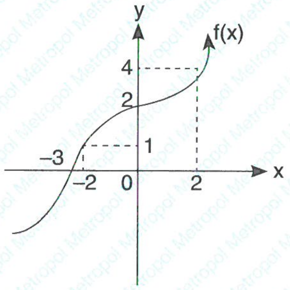
Yanıt / The Answer is $\frac{1}{4}$

124. $(f^{-1}og)(0) = ?$



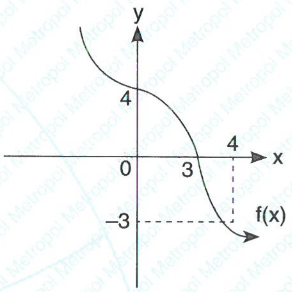
Yanıt / The Answer is 2

125. $\dfrac{f(-3)+f(2)}{f^{-1}(2)-f^{-1}(1)} = ?$



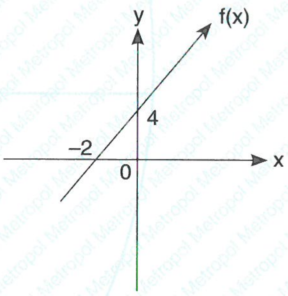
Yanıt / The Answer is 2

126. $\dfrac{f^{-1}(0)+f^{-1}(4)}{f(4)} = ?$



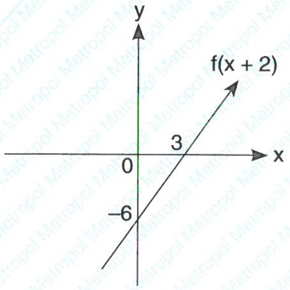
Yanıt / The Answer is –1

127. $f(2) - f^{-1}(-1) = ?$



Yanıt / The Answer is $\frac{21}{2}$

128. $f^{-1}(4) \cdot f(2) = ?$



Yanıt / The Answer is –42

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1. f: A → B, A = {–1, 0 1},
$f(x) = -x - 1$
⇒ **B = ?**

A) {–2, –1, 0}
B) {–1, 0, 1}
C) {0, 1, 2}
D) {–3, –2, 1}
E) {–2, 0, 1}

2. f : A → B,
A = {–2, 1, 2},
B = {–3, –2, –1, 1, 2, 3},
$f(x) = x^2 - 3$ ⇒ **f = ?**

A) {(–2, 1), (1, –2), (2, 1)}
B) {(–2, 1), (1, –2)}
C) {(1, 2), (2, 1), (–2, 1)}
D) {(–2, –2), (1, 1), (2, 2)}
E) {(2, 2), (1, 1), (–2, –2)}

3. f : A → B, A = {0, 1, 2, 3}
$f(x) = 3x - 6$ ⇒ **B = ?**

A) {–3, –2, –1, 0}
B) {–6, –3, 0, 3}
C) {–6, –3, 3, 6}
D) {–3, 0, 3, 6}
E) {0, 1, 2, 3}

4. f : A → B ve (and) A = {–1, 0, 1, 2}
$f(x) = 2x - 4$ ⇒ **$\sum f(A)$ = ?**

A) –12 B) –8 C) –6 D) 8 E) 12

5. f = {(–2, 3), (2, –1), (3, 1), (5, 4)},
g = {(3, 5), (–2, 4), (4, 3), (1, 2)}
⇒ **f + g = ?**

A) {(7, 4), (6, 6)}
B) {(–2, 7), (3, 6)}
C) {(–4, 7), (6, 6)}
D) {(1, 8), (0, 3), (7, 4), (6, 6)}
E) ∅

6. f: R → R,
$y = f(x) = -3x + 4$,
⇒ **f([–2, 3)) = ?**

A) (–5, 10]
B) (3, 8]
C) (4, 7]
D) [–5, 10)
E) [–5, 9)

7. $f(x) = x + 3$,
$g(x) = 3x - 2$ ⇒ **(2f + g)(5) = ?**

A) 20 B) 23 C) 24 D) 26 E) 29

8. $(f \cdot g)(x) = x^3 - 5x^2 + 3$,
$f(x) = x^2 - 2$ ⇒ **g(1) = ?**

A) $-\frac{4}{3}$
B) –1
C) 0
D) $\frac{4}{5}$
E) 1

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9. $f(x) = x^2 + x - 1$,
$g(x) = x^2 - x + 1$
$\Rightarrow$ **$f(1) + g(-1) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

10. $f(x) = 6x^2 - ax + 4$,
$f(2) = 0 \Rightarrow$ **$f(-1) = ?$**

A) 12 B) 16 C) 20 D) 24 E) 28

11. $f(x) = 2^{x+3} \Rightarrow$ **$f(x + 1) = ?$**

A) $f(x)$ B) $f(x) - 2$ C) $f^2(x)$ D) $2f(x)$ E) $\frac{f(x)}{2}$

12. $f(x) = x$,
$f(x) = (a - 1)x^4 + (b + 4)x^3 + (2 - c)x^2 + x + d - 5$
$\Rightarrow$ **$a + b + c + d = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

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13. $f(x) = 5x - 6$, $g(x) = 2x + 6$,
$f(2m) = g(3m) \Rightarrow$ **$m = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

14. $f : R^+ \to R$,
$f(x - 1) = x^2 - 2x + 2$,
$f(a) = 10 \Rightarrow$ **$a = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

15. $f : R^+ \to R$,
$f(x^2 + 1) = 8x - 7$
$\Rightarrow$ **$f(10) = ?$**

A) 11 B) 13 C) 15 D) 17 E) 19

16. $f(x) = \begin{cases} -x+1 & x < 0 \\ x-1 & x > 0 \end{cases} \Rightarrow$ **$f(-2) + f(3) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
A	B	B	A	B	A	E	E
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	D	D	D	C	C	D	E

1. $f(x) = 3 \cdot 2^x + 2 \cdot 3^x \Rightarrow$ **f(2) = ?**

A) 15 B) 18 C) 24 D) 28 E) 30

2. $f(x) = 2x^2 + ax - 3,$
$f(-1) = 3 \Rightarrow$ **f(3) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $f(x) = x^3 - x^2 + x + 1 \Rightarrow$ **f(2) = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

4. $f(x) = 5x^2 - 3x + 4 \Rightarrow$ **f(−1) + f(1) = ?**

A) 16 B) 18 C) 20 D) 22 E) 24

5. $f(x, y) = \min(2x, 3y),$
$g(x, y) = \max(5x, 6y)$
$\Rightarrow$ **f(4, 3) + g(2, 3) = ?**

A) 20 B) 22 C) 24 D) 26 E) 28

6. $f(5x + 1) = 2x^2 + 3x + a,$
$f(1) = 2 \Rightarrow$ **f(6) = ?**

A) 3 B) 5 C) 7 D) 9 E) 11

7. $f^2(x + 1) = x^3 + 3x^2 + 3x + 1$
$\Rightarrow$ **f(4) = ?**

A) 2 B) 4 C) 8 D) 16 E) 32

8. $f(\sqrt[3]{4x+4}) = 3^{x+2} \Rightarrow$ **f(2) = ?**

A) 3 B) 9 C) 18 D) 27 E) 81

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9. $f(5^x) = 125^x - 5^{-2x} - 5^{2x} \Rightarrow$ **f(3) = ?**

A) $\frac{160}{3}$ B) $\frac{111}{9}$ C) $\frac{160}{9}$ D) $\frac{161}{9}$ E) $\frac{163}{3}$

10. $f(3x - 7) = 2x^3 + 3x \Rightarrow$ **f(2) = ?**

A) 48 B) 52 C) 56 D) 63 E) 65

11. $f : R \to R$,

$$f(x) = \begin{cases} x^2 - 3, & x < 2 \\ 3x - 2, & x \geq 2 \end{cases}$$

$\Rightarrow$ **f(3) + f(0) = ?**

A) 2 B) 4 C) 6 D) 8 E) 12

12. $f(x) = 2^x$,

$f(x) - f(x - 1) = 32 \Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

13. $f(x) = 2x - 4 \Rightarrow$ **f(x + 1) = ?**

A) 2 – f(x) B) f(x) + 2 C) 2f(x) – 1 D) 2f(x) + 2 E) 3f(x) – 3

14. $f(x) = \frac{f(x+1) \cdot 3}{x}$, $f(4) = 12 \Rightarrow$ **f(1) = ?**

A) 28 B) 30 C) 42 D) 50 E) 54

15. $(4x - 8) \cdot f(3x + 5) + f(3x - 5) = x^3 + x^2$

$\Rightarrow$ **f(1) = ?**

A) 12 B) 14 C) 16 D) 18 E) 20

16. $f(x + 1) = 2f(x) + 4$,

$f(5) = 44 \Rightarrow$ **f(2) = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	C	C	B	D	C	C	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	D	B	E	B	E	A	E

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1. $f(x) = x^2 + 1$,
$g(x) = 8 - 2x$
$\Rightarrow$ **$(2f(x) + g(x))(3) = ?$**

A) 20 B) 21 C) 22 D) 23 E) 24

2. $f(x) = 3x - 4$, $g(x) = x + 1$,
$2 \cdot f(x) - 4 \cdot g(x) = 2 \Rightarrow$ **$x = ?$**

A) 3 B) 4 C) 5 D) 7 E) 9

3. $f(x) = 3(x^2 + 1) + x(x^2 + 3)$
$\Rightarrow$ **$f(\sqrt[3]{5} - 1) = ?$**

A) 7 B) 12 C) 17 D) 27 E) 52

4. $f(x^2 + 1) = 2x^2 + 2$
$\Rightarrow$ **$f(1) + f(2) + \ldots + f(11) = ?$**

A) 128 B) 129 C) 132 D) 135 E) 138

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5. $f(3x^2 - 4x + 1) = 6x^2 - 8x + 3 \Rightarrow$ **$f(6) = ?$**

A) 5 B) 6 C) 9 D) 12 E) 13

6. $f(x + 1) = f(x) + 2$
$f(1) = 2 \Rightarrow$ **$f(10) = ?$**

A) 10 B) 12 C) 14 D) 18 E) 20

7. $f(a \cdot b) = f(a) + f(b)$,
$f(3) = 4 \Rightarrow$ **$f(27) = ?$**

A) 4 B) 8 C) 12 D) 16 E) 20

8. $f(x) = \begin{cases} x - 4, & x < 3 \\ x + 4, & x \geq 3 \end{cases}, \quad g(x) = \begin{cases} \frac{2}{x}, & x > 2 \\ -3, & x \leq 2 \end{cases}$

$\Rightarrow$ **$\dfrac{f(-2) + g(0)}{f(4) - g(4)} = ?$**

A) $-\frac{6}{5}$ B) $-\frac{3}{5}$ C) $-\frac{2}{15}$ D) $\frac{3}{5}$ E) $\frac{6}{5}$

9. $f(x+2) = (x+2) \cdot f(x+1)$,

$f(2) = 4 \Rightarrow$ **$f(10) = ?$**

A) 10! B) 2·10! C) 4·10! D) 20! E) 24!

10. $f(x) = 4x - 5 \Rightarrow$ **$f(x+3) = ?$**

A) $4x + 1$ B) $4x + 4$ C) $4x + 7$ D) $4x + 12$ E) $4x + 16$

11. $f(x) = 2x^2 + 4 \Rightarrow$ **$f(x+3) = ?$**

A) $2x^2 + 12x + 22$ B) $x^2 + 6x + 13$ C) $x^2 + 12x + 22$ D) $2x^2 + 6x + 9$ E) $2x^2 + 6x + 13$

12. $x \in N^+$

$f(x) = x^2 + 2x \Rightarrow$ **$f(x-2) = ?$**

A) $x^2 + 6x$ B) $x^2 + 6x + 4$ C) $x^2 + 12x + 22$ D) $x^2 - 2x$ E) $x^2 + 6x + 8$

13. $f(x) - 2f(-x) = -x^2$

$\Rightarrow$ **$f(2) = ?$**

A) –4 B) –2 C) 2 D) 4 E) 8

14. $f : R - \left\{\frac{3}{2}\right\} \to R - \{0\}$

$f(x) = \frac{5}{2x-3} \Rightarrow$ **$f^{-1}(x) = ?$**

A) $\frac{3x}{2x-5}$ B) $\frac{x-3}{2x+5}$ C) $\frac{3x-5}{2x}$ D) $\frac{3x+5}{2x}$ E) $\frac{3x+5}{2x-3}$

15. $f(x) = x^2 + 6x + 8 \Rightarrow$ **$f^{-1}(x) = ?$**

A) $\sqrt{x+3} - 1$ B) $\sqrt{x-3} + 1$ C) $\sqrt{x+1} - 3$ D) $\sqrt{x-1} + 3$ E) $\sqrt{x+2} - 1$

16. $f(x) = 2x - 1$,

$g(x-1) = 3x - 1$

$\Rightarrow$ **$f^{-1}(5) - g^{-1}(8) = ?$**

A) –2 B) –1 C) 0 D) 1 E) 2

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1	2	3	4	5	6	7	8
C	D	A	C	E	E	C	A
9	10	11	12	13	14	15	16
B	C	A	D	D	D	C	D

1. $f : R - \{2\} \rightarrow R - \{1\}$

$f(x) = \frac{x-1}{x-2}$

$\Rightarrow$ **$f(4) \cdot f(5) \cdot f(6) \cdot \ldots \cdot f(18) = ?$**

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{9}{2}$ D) $\frac{15}{2}$ E) $\frac{17}{2}$

2. $f(x) = \begin{cases} x-2, & x < -3 \\ x^2+3, & -3 < x < 4 \\ 2x+1, & 4 \le x \end{cases}$

$\Rightarrow$ **$f(-4) - f(5) + f(2) = ?$**

A) –17 B) –10 C) –7 D) 7 E) 10

3. $f(x) = \begin{cases} x+5, & x < 2 \\ x-1, & 2 < x < 7 \\ x^2+x+1, & 7 \le x \end{cases}$

$\Rightarrow$ **$f(1) - f(6) + f(9) = ?$**

A) 92 B) 90 C) 88 D) 86 E) 84

4. $f(x) + f(2x + 1) = 6x + 10$

$\Rightarrow$ **$f(4) = ?$**

A) 8 B) 12 C) 14 D) 17 E) 21

5. $x \cdot f(x - 2) = 2x^2 - 3x + 2a + 8$

$\Rightarrow$ **$f(-1) = ?$**

A) –2 B) –1 C) 0 D) 1 E) 2

6. $f(x) = ax + b$,

$f(2) = 12$,

$f(-1) = 6$

$\Rightarrow$ **$f(0) = ?$**

A) 2 B) 4 C) 6 D) 8 E) 10

7. $x = \frac{3-2f(x)}{f(x)+4} \Rightarrow$ **$f(x) = ?$**

A) $\frac{3-4x}{x+2}$ B) $\frac{4x-6}{2x+3}$ C) $\frac{6-5x}{x+2}$ D) $\frac{4x-3}{x+2}$ E) $\frac{3-4x}{x-2}$

8. $f(x) = 3x + 6 \Rightarrow$ **$f^{-1}(12) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $f: R - \{4\} \to R - \{6\}$

$f(x) = \dfrac{ax-8}{3x-b} \Rightarrow$ **a + b = ?**

A) 15 B) 20 C) 24 D) 28 E) 30

10. $f(x) = x^2 - 6x \Rightarrow$ **$f^{-1}(x)$ = ?**

A) $\sqrt{x+3}+9$ B) $\sqrt{x-9}-3$ C) $\sqrt{x+9}+3$ D) $\sqrt{2x+5}-3$ E) $\sqrt{2x+5}-3$

11. $f(2^{x+1} - 3x - 1) = x + 1 \Rightarrow$ **$f^{-1}(4)$ = ?**

A) 4 B) 6 C) 9 D) 12 E) 15

12. $f(x) = 2^{2x-3} + 4^{x-1} \Rightarrow$ **$f^{-1}(384)$ = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

13. $f(x) = x^2 + 2,\ g(x) = 3x - 5 \Rightarrow$ **(fog)(2) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

14. $f(x) = x + 1,\ g(x) = x^2 - 3 \Rightarrow$ **(gof)(x) = ?**

A) $x^2 + x - 1$ B) $x^2 + 2x - 1$ C) $x^2 + 2x - 2$ D) $x^2 - x + 1$ E) $x^2 - 2x + 2$

15. $f(x) = (x + 1) \cdot f(x - 1),\ f(0) = 3$

$\Rightarrow$ **f(4) = ?**

A) 72 B) 156 C) 234 D) 360 E) 384

16. $A = \{1, 2, 3, 4\},\quad f: A \to A,\quad g: A \to A$

$f = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 4 & 1 & 2 \end{pmatrix},\ g = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 1 & 3 \end{pmatrix}$

$\Rightarrow$ **(f + g)(3) = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

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1	2	3	4	5	6	7	8
E	B	A	B	B	D	A	B
9	10	11	12	13	14	15	16
E	C	B	C	B	C	D	A

1. $f = \{(2, 3), (-2, 1), (1, 4), (3, -1)\}$
$\Rightarrow$ **$f(2) + f^{-1}(1) + f(1) - f^{-1}(-1) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

2. $f(x-1) + f(x+1) = 2x^2 + 6$
$\Rightarrow$ **$f(x) = ?$**

A) $x^2 + x + 1$ B) $x^2 - 1$ C) $x^2 + 1$ D) $x^2 + 2$ E) $x^2 + 2x$

3. $f(x) + f(-2x) = -6x - 12$
$\Rightarrow$ **$f(1) = ?$**

A) –2 B) –1 C) 0 D) 1 E) 2

4. $f(x) = c, \quad (c \in R)$
$f(x) = \dfrac{(a-2b)x^2 + (b-1)x + 9}{4x-3} \Rightarrow$ **$a = ?$**

A) –25 B) –22 C) –18 D) –15 E) –10

5. $f\left(\dfrac{x-1}{3x+2}\right) = \dfrac{3x+2}{1-x} \Rightarrow$ **$f\left(\dfrac{1}{9}\right) = ?$**

A) –11 B) –9 C) 9 D) 11 E) 13

6. $f(x) = 2x - 5 \Rightarrow$ **$f(3x+1) = ?$**

A) $3f(x) + 10$ B) $2f(x) + 12$ C) $3f(x) + 12$ D) $2f(x) + 10$ E) $3f(x) + 18$

7. $f: R - \{a\} \rightarrow R - \{b\}$
$f(x) = \dfrac{2x-3}{5x} \Rightarrow$ **$a + b = ?$**

A) $\frac{2}{5}$ B) $\frac{2}{3}$ C) $\frac{1}{5}$ D) $\frac{1}{3}$ E) $\frac{3}{5}$

8. $f: R \rightarrow [-4, \infty)$
$f(x) = x^2 - 4 \Rightarrow$ **$f^{-1}(x) = ?$**

A) $x^2 + 4$ B) $\dfrac{x^2+4}{2}$ C) $\dfrac{x^2-4}{4}$ D) $\sqrt{x-4}$ E) $\sqrt{x+4}$

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9. $f(x) = ax + b,$
$f^{-1}(-5) = 2,$
$f^{-1}(2) = 1 \Rightarrow$ **$b - a = ?$**

A) 12 B) 13 C) 14 D) 15 E) 16

10. $f(x) = ax + b,\ f(2) = -1,$
$f^{-1}(3) = 3 \Rightarrow$ **$f^{-1}(7) = ?$**

A) 4 B) 5 C) 6 D) 7 E) 8

11. $f(x) = \dfrac{ax-1}{x-2},\ f(x) = f^{-1}(x) \Rightarrow$ **$a = ?$**

A) –3 B) –2 C) 0 D) 2 E) 3

12. $f(x) = \begin{cases} 4 - \dfrac{x}{3}, & x < 4 \\ 5x + 2, & x \geq 4 \end{cases}$

$\Rightarrow \dfrac{(fof)(-3)}{f(-15)} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

13. $f(x) = \begin{cases} \dfrac{1-x}{3}, & x > 0 \\ \dfrac{x+3}{2}, & x \leq 0 \end{cases}$

$\Rightarrow$ **$(fofof)(1) = ?$**

A) $-\frac{1}{8}$ B) $-\frac{1}{6}$ C) $-\frac{1}{4}$ D) $\frac{1}{4}$ E) $\frac{1}{6}$

14. $f(x) = \begin{cases} x^2 + 4x + 1, & x \geq 1 \\ 2x + 3, & x < 0 \end{cases}$

$\Rightarrow$ **$(fof)(-1) + f^{-1}(-3) = ?$**

A) –3 B) –2 C) 2 D) 3 E) 5

15. $\left.\begin{array}{l} f(x) = 3x - 1 \\ (fof^{-1})(16) = 2a + 4 \end{array}\right\} \Rightarrow$ **$f^{-1}(9a + 26) = ?$**

A) 18 B) 21 C) 24 D) 27 E) 32

16. $A = \{a, b, c, d\},\ f : A \to A,\ g : A \to A,$

$f = \begin{pmatrix} a & b & c & d \\ b & d & a & c \end{pmatrix},\ g = \begin{pmatrix} a & b & c & d \\ c & a & d & b \end{pmatrix},\ (hof) = g \Rightarrow$ **$h = ?$**

A) $\begin{pmatrix} a & b & c & d \\ b & a & d & c \end{pmatrix}$ B) $\begin{pmatrix} a & b & c & d \\ c & d & b & a \end{pmatrix}$ C) $\begin{pmatrix} a & b & c & d \\ c & a & b & d \end{pmatrix}$

D) $\begin{pmatrix} a & b & c & d \\ a & b & c & d \end{pmatrix}$ E) $\begin{pmatrix} a & b & c & d \\ d & c & b & a \end{pmatrix}$

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1	2	3	4	5	6	7	8
B	D	C	B	B	C	A	E
9	10	11	12	13	14	15	16
E	A	D	C	B	D	D	E

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1. $f(x) = x$

$f(x) = (a-2)x^2 - (2b-7)x + c - 3 \Rightarrow$ **$a \cdot b \cdot c$ = ?**

A) 18 B) 20 C) 24 D) 28 E) 32

2. $f(x) = 3^{2x-1} \Rightarrow \dfrac{f(3x)}{f(3x+1)} = ?$

A) $\frac{1}{9}$ B) $\frac{1}{3}$ C) 0 D) 3 E) 9

3. $f(x) = (2x-3)\cdot(3x+1)$

$\Rightarrow$ **$f(1) + f(2) - f(3)$ = ?**

A) –21 B) –24 C) –27 D) –30 E) –33

4. $f(x) = \begin{cases} x^2+3, & x > 0 \\ x-1, & x \le 0 \end{cases}$

$\Rightarrow$ **$f(3) + f(-1) + f(2)$ = ?**

A) 5 B) 7 C) 11 D) 13 E) 17

5. $f(x) = \dfrac{ax-4}{x+8}$,

$f(x) = f^{-1}(x) \Rightarrow$ **a = ?**

A) –8 B) –6 C) –4 D) 6 E) 8

6. $f: R \to R$,

$f(3x-4) = 4x + 2$,

$f^{-1}(2a-6) = 8$

$\Rightarrow$ **a = ?**

A) 6 B) 9 C) 12 D) 15 E) 18

7. $f(5^{3x+1}) = 10 \cdot 5^{3x} \Rightarrow$ **$f^{-1}(2)$ = ?**

A) –4 B) 0 C) 1 D) 2 E) 4

8. $f: R \to R$,

$f(x) = \dfrac{2^x - 2^{-x}}{2^x + 2^{-x}}$, $f^{-1}(a) = 1 \Rightarrow$ **a = ?**

A) $\frac{3}{5}$ B) $\frac{2}{5}$ C) $\frac{1}{5}$

D) $-\frac{1}{5}$ E) $-\frac{2}{5}$

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9. $\left.\begin{array}{l} f(x) = x - 1 \\ g(x) = x^2 - 1 \\ h(x) = 3x - 3 \end{array}\right\} \Rightarrow \mathbf{(gofoh)(2) = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

10. $\left.\begin{array}{l} f(x) = 4x + 1 \\ (gof)(x) = x - 3 \end{array}\right\} \Rightarrow \mathbf{g(-7) = ?}$

A) –5 B) 0 C) 1 D) 2 E) 3

11. $f: R \to R,\ g: R \to R,$

$\left.\begin{array}{l} f(x) = 3x + 5 \\ (fof)(x) = (gof)(x) \end{array}\right\} \Rightarrow \mathbf{f(1) + g^{-1}(0) = ?}$

A) $\frac{3}{19}$ B) $\frac{3}{17}$ C) $\frac{10}{3}$ D) $\frac{17}{3}$ E) $\frac{19}{3}$

12. $f : A \to A,\ g : A \to A,$

$A = \{1, 2, 3, 4\},$

$f = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 3 & 1 \end{pmatrix},\ g = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 3 & 1 & 2 \end{pmatrix} \Rightarrow \mathbf{(fog^{-1})^{-1} = ?}$

A) $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 1 & 3 \end{pmatrix}$ B) $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 2 & 1 & 4 \end{pmatrix}$ C) $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 3 & 2 & 1 \end{pmatrix}$

D) $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 1 & 2 & 3 & 4 \end{pmatrix}$ E) $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 1 & 4 & 3 & 2 \end{pmatrix}$

13. $A = \{1,2,3,4\}$

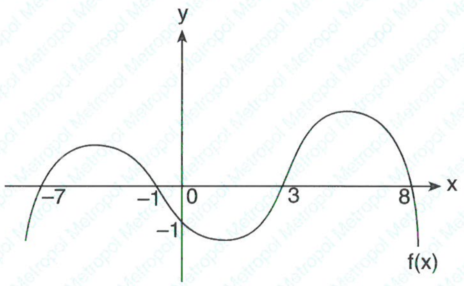
$f = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 3 & 1 & 2 \end{pmatrix},\ g = \begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 4 & 2 & 1 \end{pmatrix}$

$\Rightarrow \mathbf{(fog^{-1}) = ?}$

A) $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 1 & 2 & 3 \end{pmatrix}$ B) $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 4 & 3 \end{pmatrix}$ C) $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 3 & 1 & 2 & 4 \end{pmatrix}$

D) $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 2 & 1 & 2 & 3 \end{pmatrix}$ E) $\begin{pmatrix} 1 & 2 & 3 & 4 \\ 4 & 2 & 1 & 3 \end{pmatrix}$

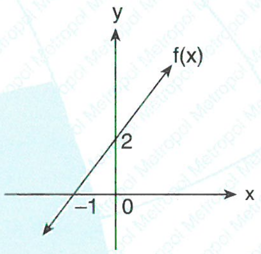
14.



$x \in Z,\ 0 \le f(x) \Rightarrow \mathbf{\sum x = ?}$

A) 2 B) 3 C) 4 D) 5 E) 6

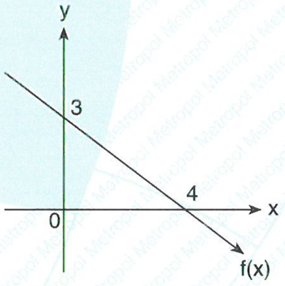
15.



$g(x) = x^2 \cdot f(x) \Rightarrow \mathbf{(gof)(-2) = ?}$

A) –10 B) –8 C) –6 D) –4 E) –2

16.



$\Rightarrow \mathbf{f(0) + f^{-1}(0) = ?}$

A) –4 B) –1 C) 0 D) 3 E) 7

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1	2	3	4	5	6	7	8
A	A	C	E	A	C	C	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	A	E	A	B	D	B	E

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1. $f(x) = x^2 + ax + 12$,
$f(4) = 40 \Rightarrow$ **a = ?**

A) 1 B) 3 C) 5 D) 7 E) 9

2. $f(5x - 2) = 9x + 13 \Rightarrow$ **f(8) = ?**

A) 23 B) 25 C) 27 D) 29 E) 31

3. $f(x) = ax + b$,
$\left.\begin{array}{l} f(2) = 1 \\ f(3) = 4 \end{array}\right\} \Rightarrow$ **f(4) = ?**

A) 7 B) 9 C) 10 D) 12 E) 14

4. $f(x) = 3x - 1$,
$g(x) = x^2 + 2$
$\Rightarrow$ **f(2x + 3) + g(x − 3) = ?**

A) $x^2 + 8$ B) $x^2 + 10$ C) $x^2 + 13$ D) $x^2 + 17$ E) $x^2 + 19$

5. $3^{f(x)+1} = x + 3 \Rightarrow$ **f(24) + f(6) = ?**

A) 3 B) 6 C) 9 D) 12 E) 18

6. $x = \dfrac{2 - f(x)}{1 - 2f(x)} \Rightarrow$ **$f^{-1}(x) = ?$**

A) $\dfrac{x-2}{2x-1}$ B) $\dfrac{x-2}{x+1}$ C) $\dfrac{2x-1}{x-2}$ D) $\dfrac{2x-1}{x+1}$ E) $\dfrac{2x-3}{x-1}$

7. $f: R - \{a\} \to R - \{b\}$,
$1 + x \cdot f(x) = \dfrac{2x + 5 \cdot f(x) - 1}{3} \Rightarrow$ **a + b = ?**

A) $\frac{1}{7}$ B) $\frac{3}{7}$ C) $\frac{5}{7}$ D) $\frac{7}{5}$ E) $\frac{7}{3}$

8. $f(x) = 8x \Rightarrow$ **(fofofofof)(x) = ?**

A) $2^8 \cdot x$ B) $2^{10} \cdot x$ C) $2^{12} \cdot x$ D) $2^{15} \cdot x$ E) $2^{16} \cdot x$

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9. $\left.\begin{array}{l} f(2x+1)=4x+1 \\ g(x)=3x-1 \end{array}\right\} \Rightarrow \mathbf{(fog)(x) = ?}$

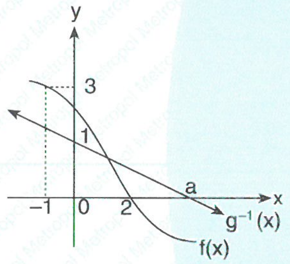
A) $6x - 3$ B) $6x - 1$ C) $3x - 1$ D) $3x + 1$ E) $3x + 2$

10. $a \neq b$,

$\left.\begin{array}{l} f(x)=x-1 \\ g(x)=x^2-2 \\ (gof)(a)=(gof)(b) \end{array}\right\} \Rightarrow \mathbf{a+b=?}$

A) 1 B) 2 C) 3 D) 4 E) 5

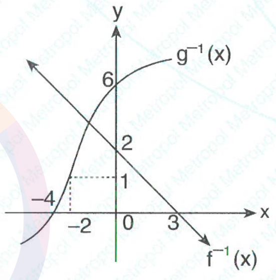
11.



$\dfrac{(g^{-1}of)(2)}{(gof^{-1})(3)} = \dfrac{1}{5} \Rightarrow \mathbf{a = ?}$

A) $\frac{2}{5}$ B) $\frac{1}{5}$ C) $\frac{5}{3}$ D) $\frac{5}{2}$ E) 5

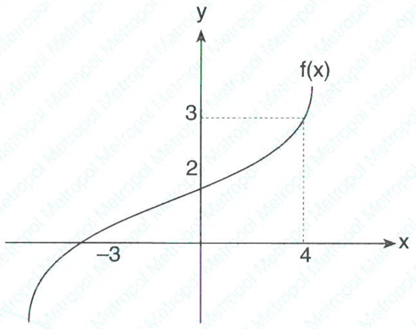
12.



$f[g^{-1}(x+1)] = -6 \Rightarrow \mathbf{x = ?}$

A) –6 B) –3 C) –1 D) 1 E) 3

13.



$\Rightarrow \mathbf{f(4) + f(0) + f^{-1}(3) = ?}$

A) 8 B) 9 C) 12 D) 15 E) 16

14. $A = \{1,2,3,4,5\}$

$f = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 3 & 1 & 5 & 4 & 2 \end{pmatrix} \Rightarrow \mathbf{f^{-1}(A) = ?}$

A) $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 2 & 5 & 1 & 4 & 3 \end{pmatrix}$ B) $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 1 & 4 & 3 & 5 & 2 \end{pmatrix}$ C) $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 5 & 1 & 2 & 3 & 4 \end{pmatrix}$

D) $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 3 & 4 & 5 & 1 & 2 \end{pmatrix}$ E) $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 4 & 5 & 1 & 2 & 3 \end{pmatrix}$

15. $A = \{g, ö, z, d, e\}$

$f = \begin{pmatrix} g & ö & z & d & e \\ z & ö & d & g & e \end{pmatrix}$,

$(fog) = \begin{pmatrix} g & ö & z & d & e \\ e & ö & g & z & d \end{pmatrix} \Rightarrow \mathbf{g = ?}$

A) $\begin{pmatrix} g & ö & z & d & e \\ e & ö & d & g & z \end{pmatrix}$ B) $\begin{pmatrix} g & ö & z & d & e \\ ö & z & d & e & g \end{pmatrix}$ C) $\begin{pmatrix} g & ö & z & d & e \\ z & d & e & g & ö \end{pmatrix}$

D) $\begin{pmatrix} g & ö & z & d & e \\ d & e & g & ö & z \end{pmatrix}$ E) $\begin{pmatrix} g & ö & z & d & e \\ e & g & ö & z & d \end{pmatrix}$

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1	2	3	4	5	6	7	8
B	E	A	E	A	A	E	D
9	10	11	12	13	14	15	
A	B	D	C	B	A	A	

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1. $f : (-5, 3] \to B$

$f(x) = 3x - 8 \Rightarrow$ **B = ?**

A) (–23,1) B) (–23,1] C) [–23,1] D) (–8, 2] E) [–8, 2]

2. $f(x) = 3x - 1 \Rightarrow$ **f(2x) = ?**

A) f(x) + 1 B) 2f(x) + 1 C) 3f(x) + 1 D) 3f(x) + 2 E) 6f(x) + 1

3. $f : R - \{1\} \to R - \{1\},\ f(x) = 1 + \frac{1}{x-1}$

$\Rightarrow$ **f(3)·f(4)·f(5)·...·f(16) = ?**

A) 6 B) 8 C) 10 D) 14 E) 16

4. $2f(x) - f(\frac{1}{x}) = 8x \Rightarrow$ **f(–2) = ?**

A) –12 B) –4 C) $-\frac{1}{2}$ D) $-\frac{1}{4}$ E) $-\frac{1}{8}$

5. $\left.\begin{array}{l} f(2x-a) = 6x+7 \\ f(2) = 4 \end{array}\right\} \Rightarrow$ **a = ?**

A) –6 B) –3 C) –1 D) 3 E) 6

6. $f : R - \{a\} \to R - \{b\}$

$x = \frac{4f(x)+1}{f(x)-6} \Rightarrow$ **a + b = ?**

A) 8 B) 10 C) 12 D) 14 E) 16

7. $f(2x - 1) = 4x + 3 \Rightarrow$ **$f^{-1}(x)$ = ?**

A) $\frac{x-1}{2}$ B) $\frac{x-2}{2}$ C) $\frac{x-3}{2}$ D) $\frac{x-4}{2}$ E) $\frac{x-5}{2}$

8. $f(x) = 4x - 3,\ f^{-1}(3x - 2) = x + 3 \Rightarrow$ **x = ?**

A) –11 B) –8 C) –4 D) 4 E) 6

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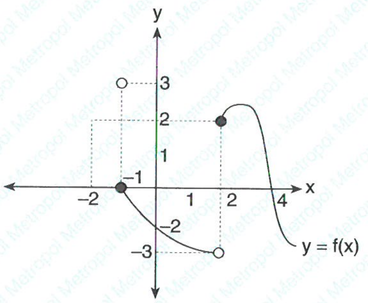
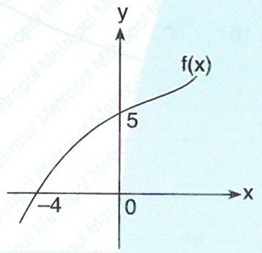
9.



$$\Rightarrow \frac{f(0)+f^{-1}(-4)}{f^{-1}(0)} = ?$$

A) 1 B) 2 C) 3 D) 4 E) 5

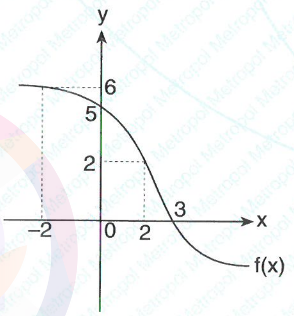
10.



$f^{-1}(f(x-2)) = f(-4) \Rightarrow x = ?$

A) –4 B) –2 C) 2 D) 4 E) 6

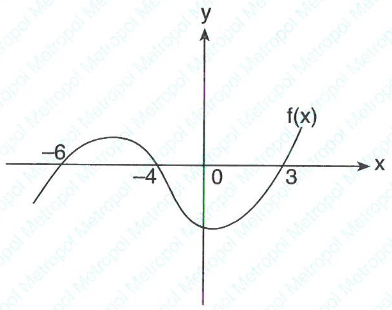
11.



$$\Rightarrow \frac{(fof)(3)+(fof)(2)}{f^{-1}(5)+f^{-1}(6)} = ?$$

A) $-\frac{9}{2}$ B) $-\frac{7}{2}$ C) $-\frac{3}{2}$ D) $\frac{2}{3}$ E) $\frac{2}{7}$

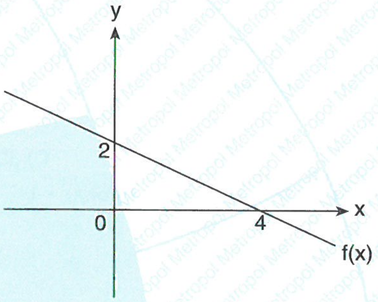
12.



$x \in Z,\ x \cdot f(x) \le 0 \Rightarrow \sum x = ?$

A) –9 B) –6 C) –3 D) 6 E) 9

13.



$\Rightarrow f^{-1}(-4) = ?$

A) 6 B) 8 C) 10 D) 12 E) 14

14. $A = \{a,b,c,d,e\}$

$f = \begin{pmatrix} a & b & c & d & e \\ b & c & d & e & a \end{pmatrix} \Rightarrow f(f(f(a))) = ?$

A) a B) b C) c D) d E) e

15. $A = \{1,2,3,4,5\}$,

$f = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 5 & 3 & 4 & 2 & 1 \end{pmatrix}$,

$g = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 3 & 4 & 2 & 1 & 5 \end{pmatrix} \Rightarrow (fog)^{-1} = ?$

A) $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 5 & 2 & 3 & 1 & 4 \end{pmatrix}$ B) $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 2 & 3 & 4 & 5 & 1 \end{pmatrix}$ C) $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 3 & 2 & 1 & 5 & 4 \end{pmatrix}$

D) $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 4 & 1 & 5 & 2 & 3 \end{pmatrix}$ E) $\begin{pmatrix} 1 & 2 & 3 & 4 & 5 \\ 3 & 5 & 1 & 2 & 4 \end{pmatrix}$

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1	2	3	4	5	6	7	8
B	B	B	A	B	B	E	A
9	10	11	12	13	14	15	
A	C	B	A	D	D	A	

1. $f(x + y) = f(x) \cdot f(y)$,
$f(2) = 4 \Rightarrow$ **$f(4) = ?$**

A) 8 B) 16 C) 24 D) 32 E) 64

2. $\left.\begin{array}{l} f(x) = 6x + 1 \\ g(x) = x^2 + 4 \end{array}\right\} \Rightarrow$ **$f(2) + g(3) = ?$**

A) 13 B) 16 C) 19 D) 23 E) 26

3. $f(2x + 1) + f(x + 2) + f(3x) = x^2 + 2x - 4$
$\Rightarrow$ **$f(0) + f(1) + f(2) + f(3) = ?$**

A) –4 B) $-\frac{13}{3}$ C) –5 D) $-\frac{16}{3}$ E) $-\frac{19}{3}$

4. $f(x) = \frac{x}{3} \cdot f(x + 1)$, $f(5) = \frac{3}{2} \Rightarrow$ **$f(3) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

5. $f: R \to R$,
$f(x - 1) + f(x + 1) = 8x - 18$
$\Rightarrow$ **$f(3) = ?$**

A) 7 B) 3 C) 0 D) –3 E) –6

6. $f\left(\frac{1 - x}{x + 1}\right) = \frac{x^2 - 3x + 6}{x^2 + 1} \Rightarrow$ **$f(1) = ?$**

A) 2 B) 4 C) 6 D) 8 E) 10

7. $f(x) = ax + b$,
$f(x) - f(x - 2) = 6$, $f(2) = 4 \Rightarrow$ **$f^{-1}(13) = ?$**

A) 2 B) 3 C) 4 D) 5 E) 6

8. $f(x) = 5^{x+2} \Rightarrow$ **$f(-2) + f^{-1}(5) = ?$**

A) –2 B) –1 C) 0 D) 1 E) 2

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9. $f : R - \{a\} \rightarrow R - \{b\}$

$f(x) = \dfrac{-3x-5}{1+2x} \Rightarrow$ **a + b = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

10. $f(x) = 3x - 2$, $(fog)(x) = 9x - 5 \Rightarrow$ $\mathbf{g^{-1}(23) = ?}$

A) 8 B) 10 C) 12 D) 15 E) 18

11. $(fog)(x) = \dfrac{2f(g(x)) + g^2(x) + 5}{3} \Rightarrow$ **f(4) = ?**

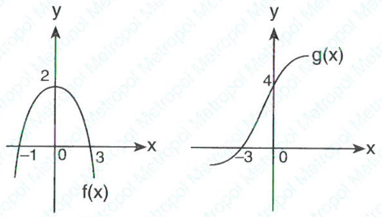
A) 21 B) 25 C) 36 D) 42 E) 45

12. $f(3x^4 + x^3) = 6x^4 + 2x^3 - 3$,

$g^{-1}(x) = \dfrac{x+2}{3} \Rightarrow$ $\mathbf{(fog^{-1})^{-1}(1) = ?}$

A) 1 B) 4 C) 8 D) 12 E) 16

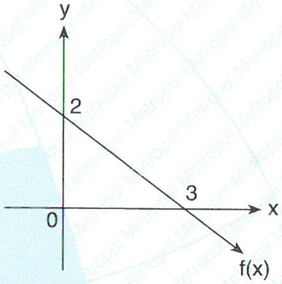
13.



$(gof)(x-2) = 4 \Rightarrow \sum$ **x = ?**

A) 6 B) 9 C) 12 D) 15 E) 18

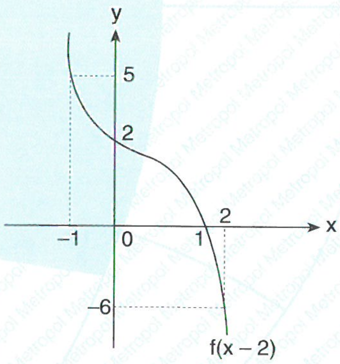
14.



$g(x) = x^2 - 1 \Rightarrow$ $\mathbf{(f^{-1}og)(3) = ?}$

A) –5 B) –8 C) –9 D) –16 E) –20

15.



$\Rightarrow \dfrac{f(0) + f(-3)}{f^{-1}(2) + f^{-1}(5)} = ?$

A) $-\frac{1}{3}$ B) $-\frac{1}{5}$ C) $\frac{1}{5}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

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1	2	3	4	5	6	7	8
B	E	B	B	B	C	D	C
9	10	11	12	13	14	15	
A	A	A	B	A	C	C	

1. $f(2^x - 2) = 7x - 5 \Rightarrow$ **f(14) = ?**

A) 21 B) 22 C) 23 D) 24 E) 25

2. $f(x) = f(x + 1) - 2$,
$f(0) = 3 \Rightarrow$ **f(9) = ?**

A) 23 B) 21 C) 18 D) 9 E) 3

3. $f : R \to R$,
$f(2x - 1) + x + 1 = 12x + 6$
$\Rightarrow$ **f(–1) – f(1) = ?**

A) –11 B) –9 C) –7 D) –5 E) –3

4. $f(x) = 2^{x-3} \Rightarrow$ **f(3x) = ?**

A) $4 \cdot f^3(x)$ B) $8 \cdot f^3(x)$ C) $16 \cdot f^3(x)$ D) $32 \cdot f^3(x)$ E) $64 \cdot f^3(x)$

5. $f(x - 1) = x^3 - 3x^2 + 3x - 1 \Rightarrow$ **$f(\sqrt[6]{3}) = ?$**

A) $\sqrt[3]{3}$ B) $\sqrt{3}$ C) 1 D) 3 E) 6

6. $(3x - 6) \cdot f(3x + 1) + f(3x - 1) = x^2 + 5 \Rightarrow$ **f(5) = ?**

A) 5 B) 6 C) 8 D) 9 E) 10

7. $f(x) = R - \{-1\} \to R - \{1\}$,
$f(x) = \dfrac{x}{x+1} \Rightarrow$ **$f(2x-1) = ?$**

A) $\dfrac{f(x)-1}{2f(x)}$ B) $\dfrac{2f(x)-1}{f(x)}$ C) $\dfrac{2f(x)-1}{2f(x)}$ D) $\dfrac{3f(x)-1}{f(x)}$ E) $\dfrac{3f(x)-1}{2f(x)}$

8. $f(x + 2) = 2f(x) - f(x-2)$,
$f(1) = 4$,
$f(3) = 6 \Rightarrow$ **f (7) = ?**

A) 4 B) 6 C) 7 D) 10 E) 14

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9. $f(x) = 2^{x-1} \Rightarrow$ **$f(2x + 4) = ?$**

A) $4f^2(x)$ B) $8f^2(x)$ C) $16f^2(x)$ D) $32f^2(x)$ E) $64f^2(x)$

10. $f(2x-3) = \dfrac{3x+m}{x-1}$

$f^{-1}(3) = 1 \Rightarrow$ **$m = ?$**

A) –2 B) –3 C) –4 D) –5 E) –6

11. $f(2x-3) = \dfrac{x+2}{3} \Rightarrow$ **$f^{-1}(2) = ?$**

A) 4 B) 5 C) 6 D) 7 E) 8

12. $f: R - \{a\} \rightarrow R - \{b\}$,

$f(x) = \dfrac{3x-2}{x+1} \Rightarrow$ **$a + b = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

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13. $\left.\begin{array}{l} g(x) = 3x - 1 \\ (gof)(x) = 2f(x) + x \end{array}\right\} \Rightarrow$ **$f(x) = ?$**

A) x – 2 B) x – 1 C) x D) x + 1 E) x + 2

t

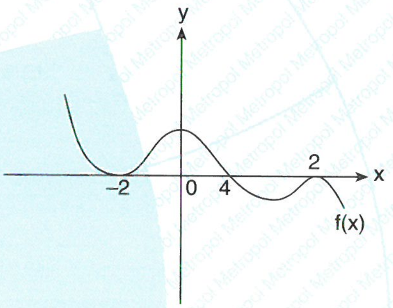
14. $f(x) = 4x - 1$,

$(gof)(x) = 8x + 5$

$\Rightarrow$ **$g(x) = ?$**

A) 2x – 7 B) 2x – 5 C) 2x – 3 D) 2x + 3 E) 2x + 7

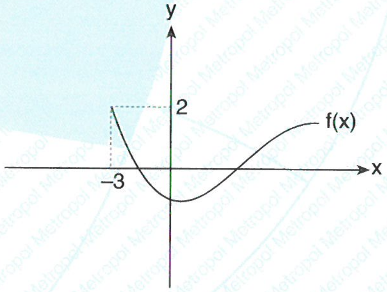
15.



$f(x) \cdot x > 0 \Rightarrow \sum x = ?$

A) 2 B) 4 C) 6 D) 8 E) 10

16.



$A = [a, b)$, $f : A \rightarrow R \Rightarrow$ **$A = ?$**

A) R B) $(-\infty, -3)$ C) $(-3, 2)$ D) $[-3, \infty)$ E) Ø

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1	2	3	4	5	6	7	8
C	B	A	E	B	D	E	D
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	B	B	B	D	E	C	D

1. $f(2x+3) = 6x - 1$

$\Rightarrow$ **f(5) + f(1) = ?**

A) –4 B) –2 C) 2 D) 4 E) 6

2. $\left.\begin{array}{l} f(mx+3) = x+2 \\ f(5) = 4 \end{array}\right\} \Rightarrow$ **m = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $f(x) = \frac{5x-1}{4}$, $f(a)+f(b) = \frac{9}{2} \Rightarrow$ **a + b = ?**

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) 2 E) 4

4. $f(x) = 4 \cdot f(x-3)$,

$f(11) = 36 \Rightarrow$ **f(2) = ?**

A) $\frac{3}{4}$ B) $\frac{3}{10}$ C) $\frac{3}{16}$ D) $\frac{9}{10}$ E) $\frac{9}{16}$

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5. $f(x) = 3^{2x} + 1 \Rightarrow$ **$f\left(\frac{x}{2}\right) = ?$**

A) $\sqrt{f(x)-1}$ B) $\sqrt{f(x)+1}$ C) $\sqrt{f(x)-2}$

D) $\sqrt{f(x)-1}+1$ E) $\sqrt{f(x)+1}-1$

6. $x = \frac{f(x)}{2 \cdot f(x)+5} \Rightarrow$ **$f^{-1}(3) = ?$**

A) $\frac{1}{3}$ B) $\frac{3}{10}$ C) $\frac{3}{11}$

D) $\frac{1}{4}$ E) $\frac{3}{13}$

7. $f(x+y) = f(x) \cdot f(y)$,

$f(16) = 8 \Rightarrow$ **f(64) = ?**

A) 8^2 B) 8^3 C) 8^4

D) 8^5 E) 8^6

8. $(f \circ f^{-1})(4x+3) = 15 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3

D) 4 E) 5

9. $f(x)=\begin{cases}4+\frac{x}{3}, & x<4\\ 2x-3, & x\geq 4\end{cases} \Rightarrow$ **(fof)(3) = ?**

A) 5 B) 7 C) 9 D) 12 E) 15

10. $\left.\begin{array}{l} f(x)=x^2+3 \\ g(x)=2x-1 \end{array}\right\} \Rightarrow$ **(fog)(2) = ?**

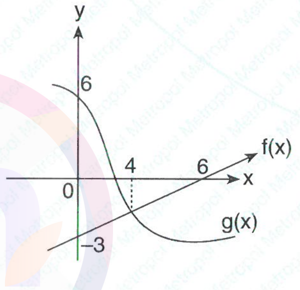
A) 12 B) 18 C) 24 D) 30 E) 36

11. $f(x)+f(2x)+f(4x)=21x-9$

$\Rightarrow$ **(fof)(2) = ?**

A) 2 B) 4 C) 6 D) 8 E) 10

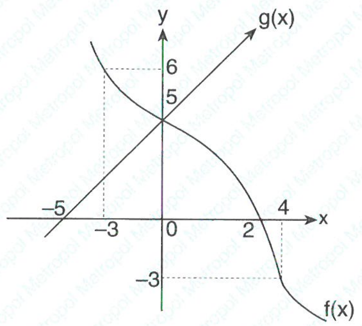
12.



$\Rightarrow$ **$(f^{-1}og)(4)+(gof^{-1})(-3)$ = ?**

A) 2 B) 4 C) 6 D) 8 E) 10

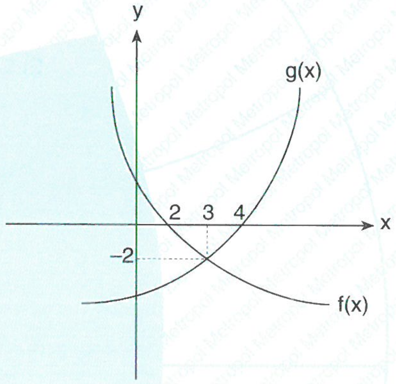
13.



$\Rightarrow$ **$(g^{-1}of)(2)$ = ?**

A) –5 B) –3 C) –2 D) 2 E) 3

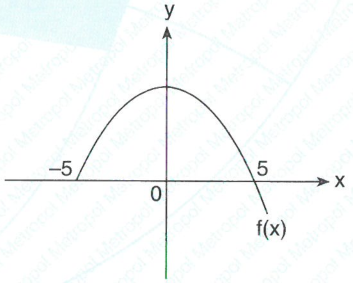
14.



$\Rightarrow$ **$(f^{-1}og)(3)$ = ?**

A) –2 B) 3 C) 4 D) 2 E) 0

15.



$x\in Z$ $x\cdot f(x)>0 \Rightarrow \sum x = ?$

A) 5 B) 7 C) 9 D) 10 E) 12

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1	2	3	4	5	6	7	8
B	A	E	E	D	C	C	C
9	10	11	12	13	14	15	
B	A	C	E	A	B	D	

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1. $f(4x + 2) = 6x - 7 \Rightarrow$ **$f(0) = ?$**

A) –6 B) –8 C) –10 D) –12 E) –14

2. $f(x + 5) = x + 5$

$\Rightarrow$ **$f(1) + f(2) + f(3) + \ldots + f(29) = ?$**

A) 305 B) 335 C) 385 D) 405 E) 435

3. $f(x) = ax + b,$

$f(2) = 4,\ f(3) = 9 \Rightarrow$ **$f(-2) = ?$**

A) –10 B) –12 C) –16 D) –18 E) –20

4. $f(2^n) = 16 - f(2^{n-1})$

$f(1) = 2 \Rightarrow$ **$f(16) = ?$**

A) 2 B) 4 C) 8 D) 16 E) 32

5. $f : R - \{3\} \to R - \{4\},$

$f(x) = \dfrac{ax - 5}{bx - 6} \Rightarrow$ **$a + b = ?$**

A) 6 B) 8 C) 10 D) 12 E) 15

6. $f(x) = \begin{cases} x^2 + 4x + 1, & x \geq 1 \\ 2x + 1, & x < 1 \end{cases}$

$g(x) = 3x + 6 \Rightarrow$ **$(gof)(-1) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

7. $f(x) = 3^{2x-1} + 2 \Rightarrow$ **$f^{-1}(11) = ?$**

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

8. $f^{-1}\left(\dfrac{x+1}{2}\right) = g(x-2) \Rightarrow$ **$(fog)(3) = ?$**

A) –3 B) –2 C) 1 D) 2 E) 3

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9. $f : [-1, \infty) \to [2, \infty)$,

$f(x) = x^2 + 2x + 3 \Rightarrow$ **$f^{-1}(x) = ?$**

A) $\sqrt{x-2}$ B) $\sqrt{x-2}-1$ C) $\sqrt{x-2}-2$

D) $\sqrt{x-2}+1$ E) $\sqrt{x-2}+2$

10. $f : R \to R$, $g : R \to R$,

$f(x) = 3x - 2$,

$(g^{-1} of)(x) = \dfrac{3x+1}{2}$

$\Rightarrow$ **$g(x) = ?$**

A) $2x - 5$ B) $2x - 3$ C) $2x - 1$

D) $2x + 1$ E) $2x + 3$

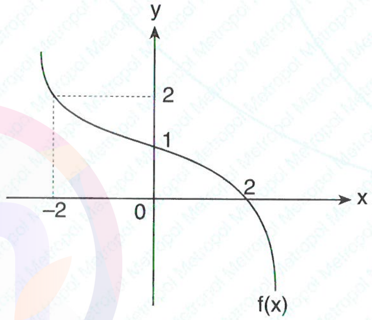
11. $f(x) = 2x$,

$(gof)(x) = \dfrac{4x}{3} - 2$,

$g(x) = \dfrac{m}{6}x + n - 4 \Rightarrow$ **$m \cdot n = ?$**

A) 6 B) 8 C) 9 D) 12 E) 18

12.



$\Rightarrow$ **$(fofof)(-2) = ?$**

A) −2 B) −1 C) 0 D) 1 E) 2

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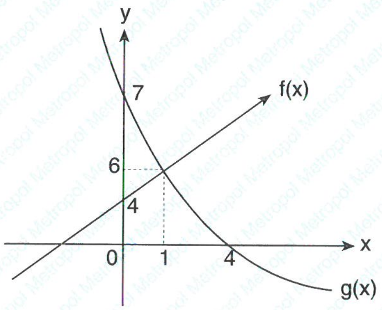
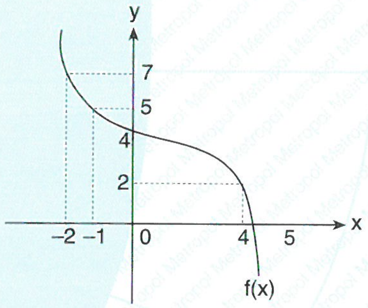
13.



$\Rightarrow \dfrac{(gof)(0)+g^{-1}(6)}{(f^{-1}og)(1)} = ?$

A) −2 B) −1 C) 1 D) 2 E) 3

14.



$\Rightarrow \dfrac{f(4)+f^{-1}(5)+f^{-1}(7)}{2f(-1)} = ?$

A) $\dfrac{-3}{10}$ B) $\dfrac{-1}{5}$ C) $\dfrac{-1}{10}$ D) $\dfrac{1}{10}$ E) $\dfrac{1}{5}$

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1	2	3	4	5	6	7	8
C	E	C	A	C	C	C	E
9	10	11	12	13	14		
B	B	B	D	C	C		

1. $f(2^x + 3) = 4^x + 2^x - 12 \Rightarrow$ **f(5) = ?**

A) –10 B) –8 C) –6 D) 6 E) 8

2. $f(2^x) = 8^x + 5 \Rightarrow$ **f(3) = ?**

A) 12 B) 15 C) 24 D) 32 E) 36

3. $f(x)=\begin{cases} 2x-3 & , \quad x<-2 \\ \sqrt{4-x^2} & , \quad -2\le x<1 \\ x-2 & , \quad 1\le x \end{cases}$

$\Rightarrow$ **f(–3) + f(0) + f(5) = ?**

A) –4 B) –2 C) 0 D) 2 E) 4

4. $f(x) = ax + b,\ f(-1) = 1$

$f(2) = 7 \Rightarrow$ **f(–2) = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

5. $f\left(\frac{x-1}{x+1}\right)=\frac{x+2}{x+3} \Rightarrow$ **f(x) = ?**

A) $\frac{x-3}{4-2x}$ B) $\frac{3-x}{4-2x}$ C) $\frac{3-x}{2x-4}$ D) $\frac{x+3}{2x-4}$ E) $\frac{x+3}{2x+4}$

6. $f(x) + f(2x) = 6x - 4 \Rightarrow$ **f(3) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

7. $f(x) = 2x + 5 \Rightarrow$ **f(2x + 1) = ?**

A) f(x) + 2
B) 2·f(x) – 1
C) 2·f(x) + 1
D) f(x) + 1
E) 2·f(x) – 3

8. $f(x)=\frac{3x+3}{2x+m},\ f(x) = f^{-1}(x) \Rightarrow$ **m = ?**

A) –3 B) –2 C) 0 D) 2 E) 3

9. $\left.\begin{array}{l} f(x)=x^2+x+1 \\ (gof)(x)=3x^2+3x+8 \end{array}\right\} \Rightarrow$ **g(4) = ?**

A) 13 B) 15 C) 17 D) 19 E) 21

10. $\left.\begin{array}{l} (g^{-1}of)(x)=3x-1 \\ f^{-1}(8)=2 \end{array}\right\} \Rightarrow$ **g(5) = ?**

A) 3 B) 5 C) 8 D) 12 E) 16

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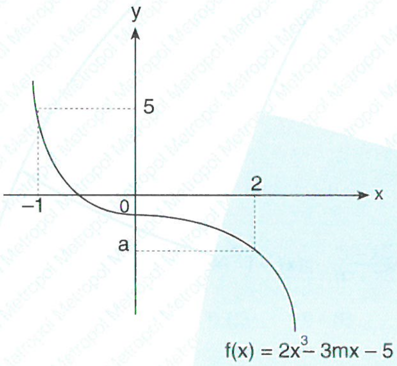
11. $f(x) = 3x + 4, \quad (gof)(x) = \frac{6x-2}{12} \Rightarrow$ $\mathbf{g^{-1}(2) = ?}$

A) $\frac{1}{2}$ B) $\frac{3}{4}$ C) 8 D) 15 E) 17

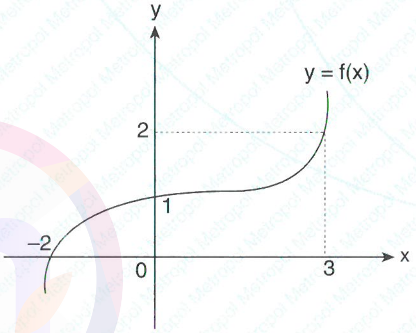
12.



$\Rightarrow$ **a = ?**

A) –13 B) –8 C) –6 D) –4 E) –2

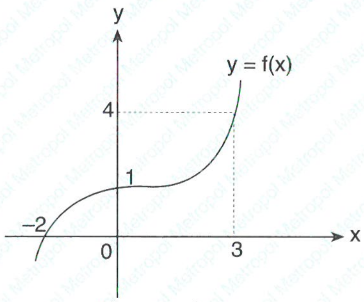
13.



$\Rightarrow$ $\mathbf{f^{-1}(2) + f(0) - f^{-1}(0) = ?}$

A) 2 B) 3 C) 4 D) 5 E) 6

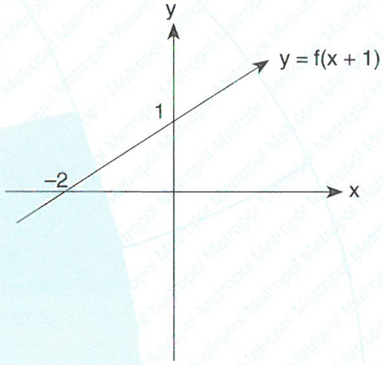
14.



$\Rightarrow \mathbf{\frac{f^{-1}(4)+f^{-1}(0)}{f(0)} = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

15.



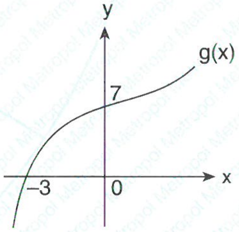
$\Rightarrow$ **f(5) = ?**

A) 2 B) $\frac{5}{2}$ C) 3 D) $\frac{7}{2}$ E) 4

16. $f(x+2) = x^2 + ax + 1,$

$(g^{-1}of)(4) = 0$

$\Rightarrow$ **a = ?**



A) –3 B) –2 C) 1 D) 2 E) 3

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1	2	3	4	5	6	7	8
C	D	A	B	B	D	E	A
9	10	11	12	13	14	15	16
C	C	E	A	E	A	C	C

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1. $f(3^x) = 4 \cdot 3^x + 12 \Rightarrow$ **f(x) = ?**

A) $4x + 3$ B) $4x + 12$ C) $4x + 15$ D) $3x - 9$ E) $3x - 12$

2. $x \in R$,

$f(2x^2 - 3x) = 4x^2 - 6x + 7 \Rightarrow$ **f(5) = ?**

A) 17 B) 19 C) 24 D) 26 E) 28

3. $f(x^{-3} + x^2 + 1) = \frac{x^{-3}}{2} + \frac{x^2}{2} + 2^{-1} + 1 \Rightarrow$ **f(5) = ?**

A) $\frac{2}{7}$ B) $\frac{3}{7}$ C) $\frac{5}{7}$ D) $\frac{7}{2}$ E) $\frac{7}{3}$

4. $f : R \to R$,

$f(x + 1) = f(x) + 3$,

$f(3) = 4 \Rightarrow$ **f(7) = ?**

A) 8 B) 10 C) 12 D) 16 E) 18

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5. $f\left(\frac{3}{x}\right) = \frac{9 + x^3}{x^2} \Rightarrow$ **f(3x) = ?**

A) $9x^2 + \frac{1}{x}$ B) $9x^3 + \frac{1}{x^2}$ C) $9x^3 + \frac{1}{x}$ D) $3x^2 + \frac{1}{x}$ E) $3x^3 + \frac{1}{x}$

6. $f(x) = 3^{2x} + 1 \Rightarrow$ **$f\left(\frac{x}{2}\right)$ = ?**

A) $\sqrt{f(x) - 1}$ B) $\sqrt{f(x) + 1}$ C) $\sqrt{f(x) - 2}$ D) $\sqrt{f(x) - 1} + 1$ E) $\sqrt{f(x) + 1} - 1$

7. $f(a + b) = f(a) + f(b)$,

$f(1) = 3 \Rightarrow$ **f(97) = ?**

A) 97 B) 194 C) 291 D) 388 E) 485

8. $x = \frac{3f(x) - 2}{4f(x) - 5} \Rightarrow$ **$f^{-1}(2)$ = ?**

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 1 D) $\frac{4}{3}$ E) $\frac{5}{3}$

9. $f(x+1) = 2^{x+3} - 1 \Rightarrow$ $\mathbf{f^{-1}(15) = ?}$

A) 1 B) 2 C) 3 D) 4 E) 5

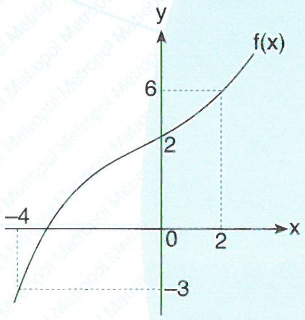
10. $A = \{a, b, c, d, e\}$

$f: A \longrightarrow A$

$f = \begin{pmatrix} a & b & c & d & e \\ c & d & b & e & a \end{pmatrix} \Rightarrow (f^{-1} o f^{-1} o f^{-1})(b) = ?$

A) a B) b C) c D) d E) e

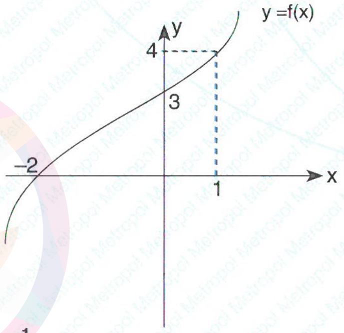
11.



$\Rightarrow \dfrac{(fof)(0)}{f^{-1}(-3)} = ?$

A) $-\frac{3}{2}$ B) $-\frac{2}{3}$ C) $\frac{2}{3}$ D) $\frac{3}{4}$ E) $\frac{3}{2}$

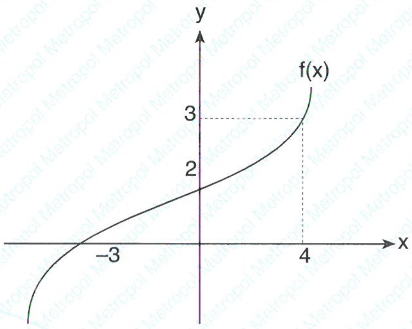
12.



$\Rightarrow (fof)(-2) + f^{-1}(4) = ?$

A) –6 B) –4 C) 3 D) 4 E) 5

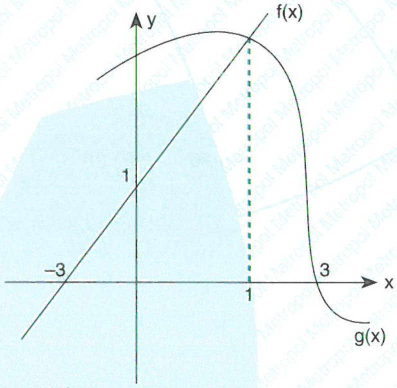
13.



$\Rightarrow$ $\mathbf{f(4) + f(0) + f^{-1}(3) = ?}$

A) 8 B) 9 C) 12 D) 15 E) 16

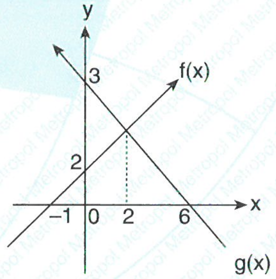
14.



$\Rightarrow$ $\mathbf{(f^{-1}og)(1) = ?}$

A) $-\frac{3}{2}$ B) –1 C) 0 D) 1 E) 2

15.



$\Rightarrow$ $\mathbf{(fog^{-1})(1) + (g^{-1}of)(3) = ?}$

A) –2 B) –1 C) 0 D) 1 E) 2

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1	2	3	4	5	6	7	8
B	A	D	D	A	D	C	D
9	10	11	12	13	14	15	
B	E	A	D	B	D	C	

1. $f : R \to R$,

$f(x) = 2x - 1 \Rightarrow$ **$f(2x - 1) = ?$**

A) $2x - 1$ B) $4x - 1$ C) $2x - 2$ D) $4x - 3$ E) $4x - 4$

2. $f(x) = ax + b$,

$f(-1) = 1$,

$f(1) = 3 \Rightarrow$ **$f(4) = ?$**

A) 3 B) 4 C) 5 D) 6 E) 7

3. $f(2) = 3$,

$f(x + 2) + x = f(x + 1) + x^2 + 1$

$\Rightarrow$ **$f(4) = ?$**

A) 2 B) 3 C) 4 D) 7 E) 9

4. $f(x) = 3^{x-1}$

$\Rightarrow$ **$f(x + 1) - f(x + 2) - 3 \cdot f(x) = ?$**

A) 3^x B) 3^2 C) -3^x D) -3^{x+1} E) 1

5. $f(x) = f(x - 1) + x$,

$f(1) = 1 \Rightarrow$ **$f(20) = ?$**

A) 205 B) 207 C) 210 D) 211 E) 213

6. $f(x) = ax + b$,

$f^{-1}(1-x) = 2x + 4$

$\Rightarrow$ **$b = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

7. $f(x) = \begin{cases} ax + 4, & x < 1 \\ 2x - 5, & x \geq 1 \end{cases}$

$(fof)(2) = 2 \Rightarrow$ **$a = ?$**

A) -2 B) -1 C) 2 D) 3 E) 4

8. $f(x) = \dfrac{x+1}{x-1} \Rightarrow$ **$(fof)(x) = ?$**

A) x B) $\dfrac{2x+1}{5-x}$ C) $\dfrac{2x-1}{x-5}$ D) $\dfrac{2x+1}{x-5}$ E) $\dfrac{x+1}{x-5}$

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9. $\left.\begin{array}{l}(fog)(x)=g(x)+a \\ f^{-1}(7)=2\end{array}\right\} \Rightarrow$ **a = ?**

A) 2 B) 3 C) 5 D) 7 E) 9

10. $g(x) = 3x^2 - 2,\ f(x) = 2x + 3 \Rightarrow$ **(gof)(0) = ?**

A) 24 B) 25 C) 27 D) 30 E) 33

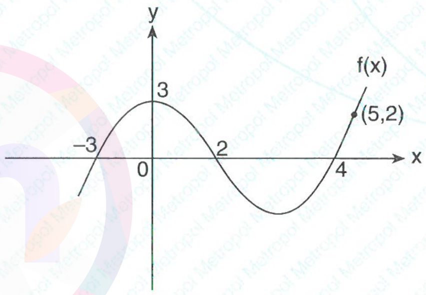
11. $(gof)(x)=\dfrac{3f(x)-4}{5} \Rightarrow$ $\mathbf{g^{-1}(1) = ?}$

A) 1 B) 3 C) 5 D) 7 E) 12

12. $f(x) + f(x + 1) = 6x - 5 \Rightarrow$ $\mathbf{f^{-1}(5) = ?}$

A) –3 B) –1 C) 0 D) 1 E) 3

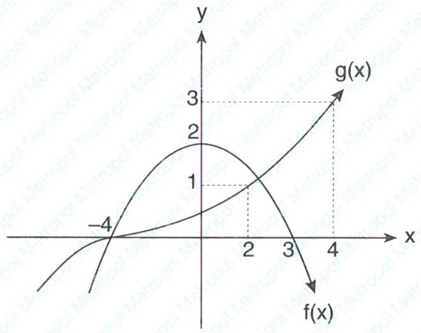
13.



$\Rightarrow$ **f(–3) + f(2) + f(0) + f(4) + f(5) = ?**

A) 6 B) 5 C) 4 D) 3 E) 2

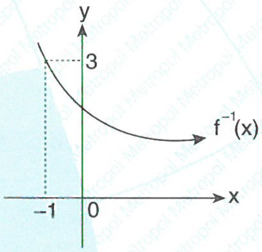
14.



$\Rightarrow$ **(gofof)(3) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

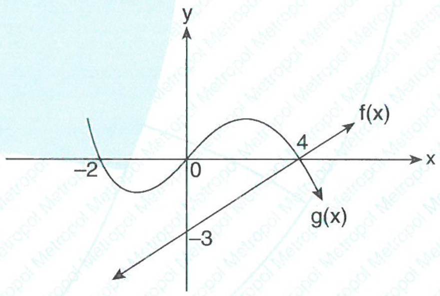
15.



$g(x) = x - 3 \Rightarrow$ $\mathbf{(g^{-1}of)(3) = ?}$

A) –2 B) –1 C) 0 D) 1 E) 2

16.



$(fog)(x - 2) = -3 \Rightarrow$ $\mathbf{\sum x = ?}$

A) 2 B) 4 C) 6 D) 8 E) 10

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1	2	3	4	5	6	7	8
D	D	D	D	C	C	C	A
9	10	11	12	13	14	15	16
C	B	B	E	B	A	E	D

1. $f(x) = x^3 - 3x^2 + 3x - 1$

$\Rightarrow$ **f(4) = ?**

A) 6 B) 12 C) 16 D) 20 E) 27

2. $f\left(\frac{x}{2} - 1\right) = x^2 - 2x + a,$

$f(-2) = 0 \Rightarrow$ **a = ?**

A) –1 B) –2 C) –4 D) –6 E) –8

3. $f(x + y) = f(x) + f(y),$

$f(4) = 10 \Rightarrow$ **f(8) = ?**

A) –15 B) –10 C) 5 D) 10 E) 20

4. $f(3x - 2) = 2x - 3 \Rightarrow$ **f(x) = ?**

A) $\frac{2x-5}{3}$ B) $\frac{2x+5}{3}$ C) $\frac{3x+5}{3}$ D) $\frac{3x-2}{3}$ E) $\frac{2x-2}{3}$

5. $f(x) = f(x - 1) + x,$

$f(1) = 1 \Rightarrow$ **f(10) = ?**

A) 40 B) 45 C) 50 D) 55 E) 60

6. $f(x) = 4^{x-1} \Rightarrow \mathbf{f\left(\frac{x-2}{2}\right) = ?}$

A) $\frac{\sqrt{f(x)}}{8}$ B) $\frac{\sqrt{f(x)}}{2}$ C) $\frac{\sqrt{f(x)}}{4}$ D) $\sqrt{f(x)}$ E) $\frac{1}{\sqrt{f(x)}}$

7. $f : R - \left\{\frac{1}{2}\right\} \to R - \left\{-\frac{3}{2}\right\}$

$f(x) = \frac{-3x+4}{2x-1} \Rightarrow \mathbf{f^{-1}(3) = ?}$

A) $\frac{7}{9}$ B) 1 C) $\frac{11}{9}$ D) $\frac{16}{9}$ E) 2

8. $f: R \to R,$

$f(x) = x + 2,$

$g(x) = \begin{cases} x+1, & x \geq 1 \\ x^2, & x < 1 \end{cases}$

$\Rightarrow$ **(gof)(–3) = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

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9. $f(2x-5) = 3x + 2,$

$f^{-1}(a+3) = 7 \Rightarrow$ **a = ?**

A) 10 B) 12 C) 15 D) 17 E) 20

10. $\left.\begin{array}{l} f(x) = ax + b \\ g(x) = bx \\ f(1) = 3,\ g(-1) = 2 \end{array}\right\} \Rightarrow (f^{-1}og)(6) = ?$

A) –2 B) –1 C) 2 D) 3 E) 6

11. $f(x) = x^2 + 3x$

$(fog)(x) = x^2 - 3x + 9 \Rightarrow$ **g(x) = ?**

A) x – 5 B) x – 4 C) x – 3 D) x – 2 E) x – 1

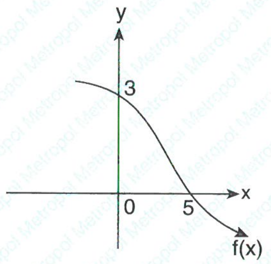
12. $f(x) = 3x - 1,$

$g(x) = \dfrac{3x+5}{x+7},$

$(g^{-1} \text{ o } f)(x) = -9 \Rightarrow$ **x = ?**

A) 4 B) 7 C) 9 D) 12 E) 15

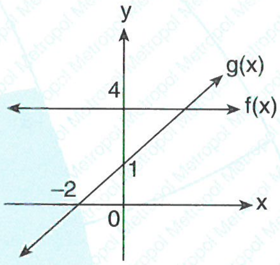
13.



$(fof)(x-1) = 3 \Rightarrow$ **x = ?**

A) 4 B) 6 C) 9 D) 10 E) 12

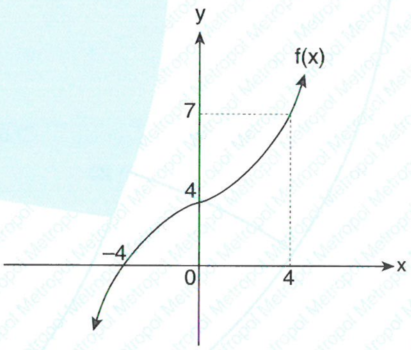
14.



$\Rightarrow$ **$(g^{-1}ogof)(6) = ?$**

A) 2 B) 4 C) 6 D) 8 E) 10

15.



$f(a-2) = f^{-1}(7) \Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

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1	2	3	4	5	6	7	8
E	E	E	A	D	A	A	D
9	**10**	**11**	**12**	**13**	**14**	**15**	
D	A	C	A	B	B	B	

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1. $f(x^2 - 2x - 3) = 4x^2 - 8x - 11$

$\Rightarrow$ **f(x) = ?**

A) $4x - 1$ B) $4x + 1$ C) $4x + 3$ D) $4x + 5$ E) $4x + 7$

2. $f\left(\dfrac{x^2+1}{x^2+2}\right) = x^4 + 3x^2 - 3 \Rightarrow f\left(\dfrac{2}{3}\right) = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

3. $f(x+2) = \dfrac{x^2+4x+4}{x+3} \Rightarrow f(x) = ?$

A) $\dfrac{x^2}{x+1}$ B) $\dfrac{x^2}{x-1}$ C) $\dfrac{x}{x+1}$ D) $\dfrac{x}{x-1}$ E) $\dfrac{1}{x+1}$

4. $f(x-1) = \dfrac{2 \cdot f(x) + 3}{2}$

$f(1) = 5 \Rightarrow f(3) = ?$

A) $\dfrac{1}{2}$ B) 1 C) $\dfrac{3}{2}$ D) 2 E) $\dfrac{5}{2}$

5. $f(x) = ax$,

$f(x) - f(-x) = -4x$

$\Rightarrow$ **f(x − 1) = ?**

A) $2x$ B) $2x + 1$ C) $2x + 3$ D) $-2x + 2$ E) $2x - 1$

6. $f(x - 1) = x^2 - 2x + 4$

$\Rightarrow$ **f(x + 1) = ?**

A) $x^2 + 2x + 4$ B) $x^2 - 2x + 7$ C) $x^2 + 2x + 1$ D) $x^2 + 2x - 7$ E) $x^2 - 2x - 4$

7. $f(x) = 1 - \dfrac{1}{x} \Rightarrow f(3x) = ?$

A) $\dfrac{4f(x)-1}{3}$ B) $\dfrac{f(x)}{3}$ C) $\dfrac{f(x)-2}{3}$ D) $\dfrac{f(x)+2}{3}$ E) $\dfrac{3f(x)-1}{3}$

8. $f(2x-3) = \dfrac{x+2}{3} \Rightarrow f^{-1}(2) = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

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9. $f(x) = 81^x \Rightarrow f^{-1}(27) \cdot f^{-1}\left(\frac{1}{9}\right) = ?$

A) $-\frac{3}{8}$ B) $-\frac{1}{4}$ C) $\frac{1}{2}$ D) $\frac{1}{4}$ E) $\frac{3}{8}$

10. $f^{-1}(x^2 - 4) = 4x + 6 \Rightarrow$ **f(–2) = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

11. $g(4) \in R^+$, $f(x) = x^2 + 4x$,

$(fog)(x) = 2x + 2 \cdot g(x) \Rightarrow$ **g(4) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

12. $f(x) = 2x - 24$, $g(x) = ax + 3a$,

$(fog)(x) = (gof)(x) \Rightarrow$ **a = ?**

A) $\frac{2}{3}$ B) $\frac{4}{3}$ C) $\frac{4}{9}$ D) $\frac{7}{9}$ E) $\frac{8}{9}$

13. $f: R \to R$, $g: R \to R$

$f(x) = 3x^2 - 2x$,

$(gof)(x) = 6x^2 - 4x + 7 \Rightarrow$ **g(2) = ?**

A) 5 B) 7 C) 9 D) 11 E) 13

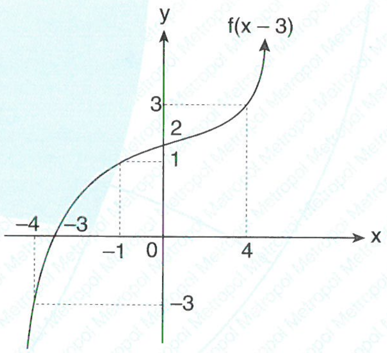
14. $f(x) = 4x - 1$,

$(fog)(x) = 8x + 11$

$\Rightarrow$ **g(x) = ?**

A) 3x – 2 B) 3x – 1 C) 2x – 2 D) 2x + 2 E) 2x + 3

15.



$\Rightarrow$ **$(fof)(-4) - (fof)^{-1}(2) = ?$**

A) –10 B) –5 C) 0 D) 5 E) 10

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1	2	3	4	5	6	7	8
B	A	A	D	D	A	D	B
9	10	11	12	13	14	15	
A	C	B	E	D	E	E	

1. $f\left(\frac{2}{x}\right)=\frac{3x}{2x+1} \Rightarrow$ **f(x) = ?**

A) $\frac{3}{x+1}$ B) $\frac{6}{x+4}$ C) $\frac{2x+1}{3x}$ D) $\frac{4x+2}{6x}$ E) $\frac{x+1}{5}$

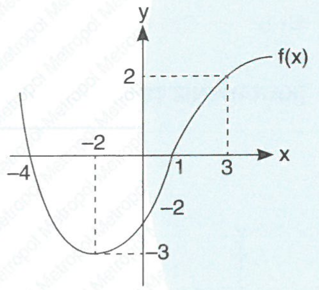
[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

2. $x=\frac{3\cdot f(x)+2}{2\cdot f(x)-4} \Rightarrow$ **$f^{-1}(x)$ = ?**

A) $\frac{2x-4}{3x-2}$ B) $\frac{3x-4}{2x-5}$ C) $\frac{3x+2}{2x-4}$ D) $\frac{4x-3}{3x-2}$ E) $\frac{1}{x}$

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

3.



$\Rightarrow$ **$f^{-1}(2)$ + (fof)(1) = ?**

A) 4 B) 3 C) 1 D) –1 E) –2

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

4. f : R→R, $f(x) = x^2 - 4 \Rightarrow$ **$f^{-1}(x)$ = ?**

A) $\sqrt{x+4}$ B) $\sqrt{x-4}$ C) $\sqrt{x}+4$ D) $\sqrt{x}-4$ E) $\sqrt{x-2}$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

5. f: R→R, g: R→R

$f(x + 1) = -2x^4 - 8x^3 - 12x^2 - 8x - 2$

$g(x) = x^3 - 8 \Rightarrow$ **(gof)(–1) = ?**

A) 16 B) 7 C) 0 D) –7 E) –16

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

6. $f\left(\frac{x}{3}\right)+2\cdot f\left(\frac{3}{x}\right)=2x-1 \Rightarrow$ **f(2) + f(1) = ?**

A) $-\frac{10}{3}$ B) $-\frac{2}{3}$ C) $-\frac{7}{3}$ D) –2 E) –3

[DUMLUPINAR ÜNİVERSİTESİ – YÖS 2018]

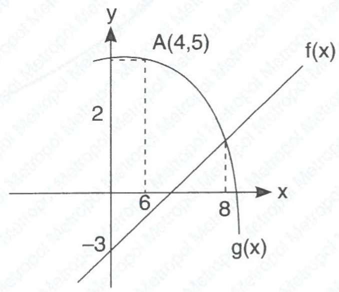
7. $f(x-1)=\frac{2}{3}+f(x)$

$f(0)=36-f(21) \Rightarrow$ **f(0) = ?**

A) 20 B) 25 C) 30 D) 35 E) 40

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

8.



$\Rightarrow$ **$(gof^{-1})(-1)+(f^{-1}og)(8)$ = ?**

A) 10 B) 12 C) 13 D) 14 E) 16

[İSTANBUL ÜNİVERSİTESİ – YÖS 2017]

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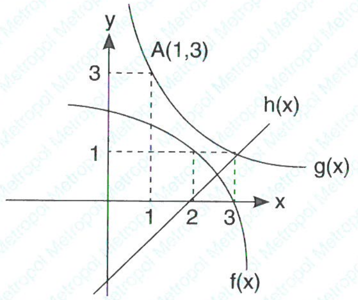
9.



$(h \circ f)(x) = x^3 - 2x + 2a \Rightarrow$ **a = ?**

A) –3 B) $-\frac{3}{2}$ C) $-\frac{3}{4}$ D) 0 E) $\frac{1}{2}$

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2017]

10. $f(x-1) = 2x + 3$

$g(3x-1) = f^{-1}(x) \Rightarrow$ **g(x) = ?**

A) 6x – 2 B) $\frac{x-6}{2}$ C) $\frac{x+16}{6}$ D) $\frac{x-14}{6}$ E) $\frac{x-11}{2}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

11. $x = \frac{3f(x)}{5 \cdot f(x) - 2} \Rightarrow$ $\mathbf{f^{-1}(-2) = ?}$

A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{2}{7}$ D) $\frac{3}{4}$ E) $\frac{1}{3}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

12. $f: (0, \infty) \to R$

$f(x) = \frac{2x+1}{\sqrt{4x^2 - 2x + 7}} \Rightarrow$ **f(1) = ?**

A) $\frac{1}{9}$ B) $\frac{2}{9}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$ E) 1

[ANADOLU ÜNİVERSİTESİ – YÖS 2017]

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13. $g(x) = \frac{x+7}{3-x}$, $(f \circ g)(x) = 3x + 5 \Rightarrow$ **f(2) = ?**

A) –2 B) –1 C) 2 D) 4 E) 6

[ANADOLU ÜNİVERSİTESİ – YÖS 2017]

14. $f: R \to R$

$f(3x+1) = 5x + 2$

$f^{-1}(a) = 10 \Rightarrow$ **a = ?**

A) 17 B) 18 C) 19 D) 20 E) 21

[ERCİYES ÜNİVERSİTESİ – YÖS 2017]

15. $f: R \to R$

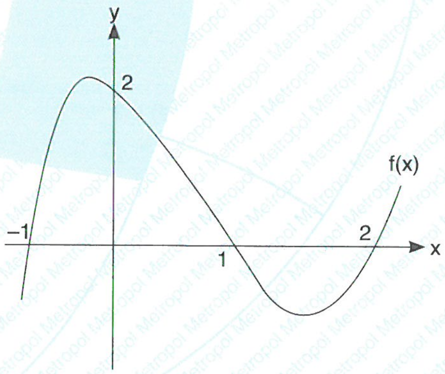
$f(x-1) = \frac{f(x)}{2} + 1$

$f(0) = 3 \Rightarrow$ **f(3) = ?**

A) 10 B) 12 C) 14 D) 16 E) 18

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

16.



$\Rightarrow$ **f(1) + f(f(2)) = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	C	C	A	E	B	B	C
9	10	11	12	13	14	15	16
B	D	A	E	D	A	A	C

BÖLÜM CHAPTER 14

TARİHSEL NOT / HISTORICAL NOTE

Borel Felix Edouard Justin Emile [1871 - 1956]

Yunan gökbilimci ve matematikçi. Bessel fonksiyonları, diferansiyel denklemlerin elde edilmesinde, fonksiyonlardan sonra mühendislik ve fizik alanında sık kullanılır.

German astronomer and mathematician who made a major contribution to mathematics in the development of what are now called Bessel functions. These functions, which satisfy certain differential equations, and probably the most commonly occurring functions in physics and engineering after the elementary functions.

İŞLEM ve MODÜLER ARİTMETİK
OPERATION and MODULAR ARITHMETIC

Bu bölüm 64 alıştırma sorusu, 143 test sorusu ve 16 YÖS sorusu içermektedir.

This chapter includes 64 exercise questions, 143 test questions and 16 YÖS questions.

BÖLÜM / CHAPTER 14

İŞLEM ve MODÜLER ARİTMETİK / OPERATION and MODULAR ARITHMETIC

- İşlem ve Modüler Aritmetik / Operation and Modular Arithmetic .... 535 - 564

BÖLÜM 14 CHAPTER

İŞLEM ve MODÜLER ARİTMETİK
OPERATION and MODULAR ARITHMETIC

Alıştırmalar / Exercises

İşlem ve Modüler Aritmetik / Operation and Modular Arithmetic

1. $x \Delta y = x \cdot y + 2 \Rightarrow$ **$3 \Delta 5 = ?$**

Yanıt / The Answer is 17

2. $x \square y = 2x + y + 1 \Rightarrow$ **$-3 \square 2 = ?$**

Yanıt / The Answer is –3

3. $a \Delta b = 2a - 3b + 5 \Rightarrow$ **$4 \Delta 5 = ?$**

Yanıt / The Answer is –2

4. $m \Delta n = n^m - m \cdot n \Rightarrow$ **$3 \Delta 4 = ?$**

Yanıt / The Answer is 52

5. $a \Delta b = a + b - 1 \Rightarrow$ **$(2 \Delta 3) \Delta 4 = ?$**

Yanıt / The Answer is 7

6. $x \square y = \begin{cases} 2x + y, & x < y \\ x^2 + y^2, & x = y \\ x - 3y, & x > y \end{cases} \Rightarrow$ **$(-1 \square 1) \square (2 \square 1) = ?$**

Yanıt / The Answer is 2

7. $m \Delta n = m^2 - 2mn + n^2 \Rightarrow$ **$1955 \Delta 1962 = ?$**

Yanıt / The Answer is 49

8. $x \Delta y = x^{2y+3}$

$2 \Delta m = 8 \Delta 3 \Rightarrow$ **$m = ?$**

Yanıt / The Answer is 12

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9. a ❑ b = a + b – 2

5 ❑ 3 = (2 ❑ x) ⇒ **x = ?**

Yanıt / The Answer is 6

---

10. $m \Delta n = \frac{1}{m} + \frac{1}{n} - m \cdot n \Rightarrow \frac{1}{3} \Delta \frac{1}{2} = ?$

Yanıt / The Answer is $\frac{29}{6}$

---

11. $x \blacktriangle y = y^x + x \cdot y \Rightarrow \frac{1}{3} \blacktriangle 27 = ?$

Yanıt / The Answer is 12

---

12. a Δ b = a – a·b + b

a ❑ b = $a^2 - b^2$ ⇒ **(1 Δ 2) ❑ 3 = ?**

Yanıt / The Answer is –8

---

13. $m \blacksquare n = \begin{cases} m^2 + n^2, & m > n \\ \frac{m}{n-2} + 1, & m < n \end{cases} \Rightarrow (1 \blacksquare 3) \blacksquare (-1) = ?$

Yanıt / The Answer is 5

---

14. x Δ y = y Δ x

x Δ y = 3x + 3y – 2·(y Δ x) ⇒ **(3 Δ 2) Δ (3 Δ 4) = ?**

Yanıt / The Answer is 12

---

15. x Δ e = e Δ x = x

x Δ y = x + y – 2 ⇒ **e = ?**

Yanıt / The Answer is 2

---

16. x ❑ e = e ❑ x = x

x ❑ y = x + y + x·y ⇒ **e = ?**

Yanıt / The Answer is 0

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17. $x \,\square\, e = e \,\square\, x = x$

$x \,\square\, y = 2x + 2y - xy - 2 \Rightarrow$ **e = ?**

Yanıt / The Answer is 1

---

18. $x \,\Delta\, e = x, \quad x^{-1} \,\Delta\, x = e$

$x \,\Delta\, y = x + y - 1, \quad 3^{-1} = T \Rightarrow$ **T = ?**

Yanıt / The Answer is –1

---

19. $x \,\Delta\, e = x, \quad x^{-1} \,\Delta\, x = e$

$x \,\Delta\, y = 2xy - x - y + 1, \quad 2^{-1} = T \Rightarrow$ **T = ?**

Yanıt / The Answer is $\frac{2}{3}$

---

20. $x \,\square\, e = x, \quad x^{-1} \,\square\, x = e$

$x \,\square\, y = x + y + x \cdot y, \quad 7^{-1} = T \Rightarrow$ **T = ?**

Yanıt / The Answer is $\frac{-7}{8}$

Δ	T	A	R	I	M
T	R	I	M	T	A
A	I	M	T	A	R
R	M	T	A	R	I
I	T	A	R	I	M
M	A	R	I	M	T

$x \,\Delta\, x = x^2; \; x^{-1}$, x in tersi olduğuna göre 21 – 24. soruları yukarıdaki tabloya göre yanıtlayınız.

$x \,\Delta\, x = x^2; \; x^{-1}$ is the inverse element of x, answer questions 21 – 24 according to the table above.

21. **$(R \,\Delta\, A) \,\Delta\, M = ?$**

Yanıt / The Answer is A

---

22. **$R^2 \,\Delta\, A = ?$**

Yanıt / The Answer is M

---

23. **$(R \,\Delta\, M)^2 = ?$**

Yanıt / The Answer is I

---

24. **$(M^{-1} \,\Delta\, A)^2 = ?$**

Yanıt / The Answer is R

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❑	1	2	3	4	5
1	4	5	1	2	3
2	5	1	2	3	4
3	1	2	3	4	5
4	2	3	4	5	1
5	3	4	5	1	2

x ❑ x = x^2; x^{-1}, x in tersi olduğuna göre 25 – 30. soruları yukarıdaki tabloya göre yanıtlayınız.

x ❑ x = x^2; x^{-1} is the inverse element of x, answer questions 25 – 30 according to the table above.

25. **(4 ❑ 2) ❑ (2 ❑ 5) = ?**

Yanıt / The Answer is 4

---

26. **$(4^2$ ❑ $3)^2$ = ?**

Yanıt / The Answer is 2

---

27. **$(4^{-1}$ ❑ $2)^2$ = ?**

Yanıt / The Answer is 4

---

28. **$(2$ ❑ $5)^{-2}$ = ?**

Yanıt / The Answer is 1

29. **$(1$ ❑ $2)^2$ ❑ 5^{-1} = ?**

Yanıt / The Answer is 5

---

30. **$(4$ ❑ $5)^{-1}$ ❑ 3^2 = ?**

Yanıt / The Answer is 5

---

31. $x \Delta y = (x-2)\cdot(x \Delta y) + \frac{1}{y} + y - x \quad \Rightarrow \quad$ **$1 \Delta 3 = ?$**

Yanıt / The Answer is $\frac{7}{6}$

---

32. $x \Delta y = y \Delta x$

$x \Delta y = 3x + 3y - \frac{1}{2}(y \Delta x) \quad \Rightarrow \quad$ **$(3 \Delta 2) \Delta (1 \Delta 4) = ?$**

Yanıt / The Answer is 40

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33. Pazar gününden 16 gün sonra günlerden hangi gündür?

What day of the week is 16 days after sunday?

Yanıt / The Answer is salı

34. Saat tam 12:00'de çalıştırılan bir saat 62 saat sonra kaçı gösterir?

A clock starts working at 12:00, what time it will show 62 hours later?

Yanıt / The Answer is 2

35. 5 günde bir nöbet tutan bir doktor ilk nöbetini salı gün tutarsa 12. nöbetini hangi gün tutar?

A doctor takes a shift every 5 days. If the doctor takes his first shift in tuesday, what day of the week he will take his 12th shift?

Yanıt / The Answer is Pazartesi

36. 15 günde bir deneme sınavına giren Elif ilk sınavına pazar günü girdiğine göre 5. sınavına hangi gün girer?

Elif takes a test every 15 days. If she takes her first test on sunday, in which day of the week she will take her fifth test?

Yanıt / The Answer is Perşembe

37. Bir dershanede 40 dakikada bir zil çalmaktadır. İlk zil saat 08:00'de çaldığına göre 20. kez çaldığında saat kaçtır?

A school rings the bell every 40 minutes. If the bell rings at 8:00 for the first time, in what time it will ring for the 20th time?

Yanıt / The Answer is 08:40

38. CANERCANERCAN...

dizilişinde 79. harf nedir?

What is the 79th letter in the arrangement?

Yanıt / The Answer is E

39. ELİFELİFEL...

dizilişinde 106. harf nedir?

What is the 106th letter in the arrangement?

Yanıt / The Answer is L

40. METROPOLMETROPOLMET...

dizilişinde 177. Harf nedir?

What is the 177th letter in the arrangement?

Yanıt / The Answer is M

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41. $x \in N$

$55 \equiv x(\text{mod}6) \Rightarrow$ **x = ?**

Yanıt / The Answer is 1

42. $AB \in N$

$AB \equiv 19\ (\text{mod}5) \Rightarrow$ **min(AB) = ?**

Yanıt / The Answer is 14

43. $AB \in N$

$15 \equiv AB\ (\text{mod}5) \Rightarrow$ **max(AB) = ?**

Yanıt / The Answer is 95

44. $x \in N$

$3x - 1 \equiv 5(\text{mod}7) \Rightarrow$ **min(x) = ?**

Yanıt / The Answer is 2

45. $x = AB \in N$

$3x + 2 \equiv 8(\text{mod}11) \Rightarrow$ **max(AB) = ?**

Yanıt / The Answer is 90

46. $x \in N$

$4x - 2 \equiv 1\ (\text{mod}7) \Rightarrow$ **min(x) = ?**

Yanıt / The Answer is 6

47. $x = ABC \in N$

$3x - 4 \equiv 3\ (\text{mod}5) \Rightarrow$ **min(ABC) = ?**

Yanıt / The Answer is 104

48. $x = AB \in N$

$5 - 2x \equiv -2\ (\text{mod}7) \Rightarrow$ **min(AB) = ?**

Yanıt / The Answer is 14

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49. $4 < x < 12$

$50 \equiv 5 \pmod{x} \Rightarrow \sum x = ?$

Yanıt / The Answer is 14

53. $14 < x < 20$

$x \equiv 2 \pmod{3}$

$x \equiv 2 \pmod{5} \quad \Rightarrow \quad x = ?$

Yanıt / The Answer is 17

50. $5 < x < 11$

$36 \equiv 4 \pmod{x} \Rightarrow x = ?$

Yanıt / The Answer is 8

54. $90 < x < 100$

$x \equiv 3 \pmod{4}$

$x \equiv 3 \pmod{6} \quad \Rightarrow \quad x = ?$

Yanıt / The Answer is 99

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51. $1 < x < 14$

$3x + 30 \equiv 2x + 10 \pmod{x} \Rightarrow \sum x = ?$

Yanıt / The Answer is 21

55. $2^{62} \equiv x \pmod{5} \quad \Rightarrow \quad x = ?$

Yanıt / The Answer is 4

52. $3 < x < 18$

$4x + 37 \equiv 2x - 3 \pmod{5} \Rightarrow \sum x = ?$

Yanıt / The Answer is 30

56. $4^{55} \equiv x \pmod{9} \quad \Rightarrow \quad x = ?$

Yanıt / The Answer is 4

57. $3^{2018} \equiv x \pmod{10} \Rightarrow$ **x = ?**

Yanıt / The Answer is 9

58. $2^{2019} \equiv x \pmod{5} \Rightarrow$ **x = ?**

Yanıt / The Answer is 3

59. $12^{62} + 3^{55} \equiv x \pmod{5} \Rightarrow$ **x = ?**

Yanıt / The Answer is 1

60. $57^{55} + 75^{55} \equiv x \pmod{10} \Rightarrow$ **x = ?**

Yanıt / The Answer is 8

61. $88^{55} + 99^{55} \equiv x \pmod{10} \Rightarrow$ **x = ?**

Yanıt / The Answer is 1

62. $x \in N$

$(2018)^{x} \equiv 2 \pmod{5} \Rightarrow$ **min(x) = ?**

Yanıt / The Answer is 3

63. $f : Z/5 \rightarrow Z/5$

$f(x) = 3x + 2 \Rightarrow$ $f^{-1}(x) = ?$

Yanıt / The Answer is 2x + 1

64. $f : Z/5 \rightarrow Z/5$

$g : Z/5 \rightarrow Z/5$

$f(x) = 2x + 3$

$(fog)(x) = 4x + 1 \Rightarrow$ **g(x) = ?**

Yanıt / The Answer is 2x+4

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1. $x \bullet y = (x - y)^2 + xy$

$\Rightarrow$ **$(2 \bullet -1) \bullet 1 = ?$**

A) 20 B) 23 C) 30 D) 37 E) 43

2. $a \square b = 2a - b^2$

$a \triangle b = a^b + b$

$\Rightarrow$ **$(2 \triangle 1) \square (3 \triangle 2) = ?$**

A) –110 B) –113 C) –115 D) –120 E) –125

3. $a \triangle b = \sqrt{a + b - 2\sqrt{ab}}$

$\Rightarrow$ **$121 \triangle 16 = ?$**

A) 1 B) 3 C) 5 D) 7 E) 9

4. $a, b \in R^+$

$\frac{1}{a-1} \bigcirc \frac{1}{b^2} = a + b - 2$

$\Rightarrow$ **$-2 \bigcirc 4 = ?$**

A) –2 B) $-\frac{1}{2}$ C) –1 D) $\frac{1}{2}$ E) 1

5. $x \square y = x - y + 2$

$x \triangle y = x + y + (y \square x)$

$\Rightarrow$ **$15 \triangle 5 = ?$**

A) 5 B) 12 C) 15 D) 20 E) 25

6. $x \heartsuit y = x - y + 2$

$x \blacksquare y = x + y + 2$

$2 \heartsuit (3 \blacksquare m) = -2 \Rightarrow$ **$m = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

7. $x^3 \blacktriangle y^2 = x^3 - 3x^2y + 3xy^2 - y^3$

$\Rightarrow$ **$27 \blacktriangle 16 = ?$**

A) –2 B) –1 C) 0 D) 1 E) 2

8. $(2a + 1) \blacktriangle (2b - 1) = a^2 - b + ab$

$\Rightarrow$ **$3 \blacktriangle 3 = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

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9. $\sqrt[3]{x} \bigcirc \sqrt[4]{y} = x - 2y + 4$

$\Rightarrow$ **5 ❍ 3 = ?**

A) –25 B) –30 C) –33 D) –38 E) –42

10. $y \in R^+$

$\frac{1}{x} \bullet \frac{1}{y^2} = \frac{x+y}{x-y}$

$\Rightarrow$ **3 ● 4 = ?**

A) –1 B) –2 C) –3 D) – 4 E) –5

11. $(x + y) \Delta (x - y) = x^2 - y^2 + 1$

$\Rightarrow$ **4 ∆ 8 = ?**

A) 30 B) 31 C) 32 D) 33 E) 34

12. $x \Delta y = y \Delta x$

$2(x \Delta y) = x^2 + xy - (y \Delta x)$

$\Rightarrow$ **1 ∆ 2 = ?**

A) –1 B) 0 C) 1 D) 2 E) 3

13. x ◆ y = 2(y ◆ x) + 2x – y

$\Rightarrow$ **4 ◆ 5 = ?**

A) –5 B) –4 C) –3 D) –2 E) –1

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14. A = {G, E, Z, İ}

∆	G	E	Z	İ
G	İ	G	E	Z
E	G	E	Z	İ
Z	E	Z	İ	G
İ	Z	İ	G	E

$x \Delta x = x^2 \Rightarrow$ **(G ∆ İ)^2 ∆ (Z ∆ E)^2 = ?**

A) G ∆ Z B) E ∆ Z C) Z ∆ İ D) İ ∆ E E) Z ∆ Z

15. A = {A, B, C, D, E}

∆	A	B	C	D	E
A	C	D	E	A	B
B	D	E	A	B	C
C	E	A	B	C	D
D	A	B	C	D	E
E	B	C	D	E	A

$x \Delta x = x^2 \Rightarrow$ **(E ∆ D)$^{-1}$ ∆ B = ?**

A) A B) B C) C D) D E) E

16. A = {1, 2, 3, 4, 5}

∆	1	2	3	4	5
1	2	3	4	5	1
2	3	4	5	1	2
3	4	5	1	2	3
4	5	1	2	3	4
5	1	2	3	4	5

$x \Delta x = x^2 \Rightarrow$ **(1 ∆ 5)$^{-2}$ = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	C	D	C	B	A	B	A
9	10	11	12	13	14	15	16
C	E	D	C	A	A	A	C

1. $a \star b = b^a - a^4$

$\Rightarrow (-1) \star 2 = ?$

A) $\frac{1}{2}$ B) $-\frac{1}{2}$ C) 2 D) –1 E) $\frac{5}{2}$

2. $a \blacktriangle b = b - a$,

$2 \blacktriangle (1 \blacktriangle k) = 5 \Rightarrow k = ?$

A) 2 B) $\frac{3}{4}$ C) 5 D) $-\frac{6}{5}$ E) 8

3. $a \odot b = a^b - \frac{a}{b}$

$\Rightarrow (4 \odot 2) \odot (-1) = ?$

A) -13 B) 14 C) $\frac{197}{14}$ D) $\frac{195}{14}$ E) $\frac{13}{14}$

4. $a \square b = 2a + b - 1$,

$a \blacklozenge b = a + 2b - 1$,

$(3 \square m) \blacklozenge (m \square 3) = 98$

$\Rightarrow m = ?$

A) 14 B) 16 C) 18 D) 20 E) 22

5. $a \bigcirc b = a + b - 9$,

$a \blacksquare b = (a \bigcirc b) + 3$

$\Rightarrow \frac{2^{a \blacksquare b}}{2^{a \bigcirc b}} = ?$

A) 8 B) 16 C) 32 D) 64 E) 128

6. $a \blacktriangle b = \begin{cases} 0 & ,a < b \\ 1 & ,a = b \\ 2 & ,a > b \end{cases}$

$\Rightarrow (2 \blacktriangle 3) \blacktriangle (2 \blacktriangle -1) = ?$

A) 4 B) 3 C) 2 D) 1 E) 0

7. $\frac{1}{a \blacktriangle b} = b^a - a \cdot b$,

$2 \blacktriangle b = -1 \Rightarrow b = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $a \triangle b = 3a + 3b + 2ab + 3$,

$a \triangle e = a \Rightarrow e = ?$

A) –2 B) –1 C) 0 D) 1 E) 2

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9. $x \star y = \dfrac{x-y}{x+y}$,

$x \blacksquare y = 2xy - 1$,

$(1 \blacksquare 5) \star m = \dfrac{2}{3} \Rightarrow$ **m = ?**

A) 7 B) 12 C) $\frac{1}{2}$

D) $\frac{9}{5}$ E) $-\frac{4}{5}$

10.

★	M	E	H	R	A	N
M	M	E	H	R	A	N
E	E	H	R	A	N	M
H	H	R	A	N	M	E
R	R	A	N	M	E	H
A	A	N	M	E	H	R
N	N	M	E	H	R	N

(M ★ N) ★ x = H ⇒ **x = ?**

A) M B) N C) H

D) R E) A

11.

★	U	L	R	İ	C	H
U	L	R	C	H	İ	U
L	R	İ	H	U	C	L
R	İ	C	U	L	H	R
İ	C	H	L	R	U	İ
C	H	U	R	İ	L	C
H	U	L	İ	C	R	H

⇒ **(U ★ L) ★ (R ★ C) = ?**

A) U B) L C) R

D) İ E) C

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12.

A	R	M	Z	N
R	N	Z	M	R
M	Z	M	R	N
Z	M	R	N	Z
N	R	N	Z	M

⇒ **(R A M) A (Z A N) = ?**

A) R B) M C) Z

D) N E) R^{-1}

13. $a \star a = a^2$

★	a	b	c	d	e
a	b	c	d	a	e
b	c	d	a	e	b
c	d	a	e	b	c
d	a	e	b	c	d
e	e	b	c	d	a

⇒ **$(a \star e) \star (e^2 \star b^2) = ?$**

A) e B) d C) c

D) b E) a

14. y ✏ y = y^2

✏	1	2	3	4	5
1	1	2	3	4	5
2	2	3	4	5	1
3	3	4	5	1	2
4	4	5	1	y	3
5	5	x	2	3	4

⇒ **(x ✏ 1)$^{-1}$ ✏ (y^2 ✏ 3) = ?**

A) 1 B) 2 C) 3

D) 4 E) 5

15. $a \Delta b = b \Delta a$

$a \Delta b = 3a + 3b - 2(b \Delta a)$

⇒ **$\frac{2}{5} \Delta \frac{3}{5} = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

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1	2	3	4	5	6	7	8
B	E	C	C	A	E	A	B
9	**10**	**11**	**12**	**13**	**14**	**15**	
D	D	C	D	A	E	A	

1. $x \Delta y = x^2 - xy \Rightarrow$ **$(2 \Delta 1) \Delta 3 = ?$**

A) –4 B) –2 C) 2 D) 4 E) 6

2. $a \Delta b = a^2 - b^2$

$a \square b = a \cdot b - a + b$

$\Rightarrow$ **$(3 \Delta 2) \square (2 \Delta 1) = ?$**

A) 10 B) 11 C) 12 D) 13 E) 14

3. $x \Delta y = 2x + y - 2m + 3$

$2 \Delta 3 = -4 \Rightarrow$ **$m = ?$**

A) 5 B) 6 C) 7 D) 8 E) 10

4. $x \Delta y = x + 2y - 3$

$x \square y = 3x + (y \Delta x)$

$\Rightarrow$ **$(2 \Delta 1) \square 3 = ?$**

A) 5 B) 6 C) 7 D) 8 E) 10

5. $x \Delta y = x - y + x \cdot y$

$2 \Delta m = 8 \Rightarrow$ **$m = ?$**

A) 4 B) 5 C) 6 D) 7 E) 8

6. $x \Delta y = x^2 - y - 3$

$(3 \Delta 4) \Delta m = -12 \Rightarrow$ **$m = ?$**

A) 9 B) 10 C) 11 D) 12 E) 13

7. $x \square y = x + y - 4$

$x \Delta y = x + y + 2xy$

$3 \square (2 \Delta m) = 16 \Rightarrow$ **$m = ?$**

A) 2 B) 3 C) 4 D) 5 E) 6

8. $(a - 1) \Delta (b + 1) = a \cdot b + 2 \Rightarrow$ **$4 \Delta 6 = ?$**

A) 24 B) 25 C) 26 D) 27 E) 28

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9. $x \Delta (x + y) = x^2 + 2xy - 1 \Rightarrow$ **$2 \Delta 5 = ?$**

A) 10 B) 11 C) 13 D) 14 E) 15

10. $\sqrt{x} \Delta \sqrt[3]{y} = 2x - 3y + x \cdot y \Rightarrow$ **$3 \Delta 2 = ?$**

A) 66 B) 68 C) 70 D) 72 E) 74

11. $\frac{1}{x} \Delta \frac{1}{y} = \frac{x+y}{x \cdot y}$

$\Rightarrow$ **$2 \Delta 3 = ?$**

A) 4 B) 5 C) 6 D) 8 E) 10

12. $a, b \in R^+$

$x \square y = \frac{x}{y} + \frac{y}{x}$

$a \cdot b = 3$

$a \square b = 14 \Rightarrow$ **$a - b = ?$**

A) 4 B) 5 C) 6 D) 7 E) 8

13. $x \Delta y = \begin{cases} x^3, & x < y \\ y^2, & x \geq y \end{cases}$

$\Rightarrow$ **$(-2 \Delta 3) \Delta (5 \Delta 2) = ?$**

A) –512 B) –8 C) 0 D) 8 E) 512

14. $a \square b = a^2 + b^2$

$15 \square 20 = m \square 7 \Rightarrow$ **$m = ?$**

A) 18 B) 19 C) 21 D) 23 E) 24

15.

Δ	C	A	N	E	R
C	R	C	A	N	E
A	C	A	N	E	R
N	A	N	E	R	C
E	N	E	R	C	A
R	E	R	C	A	N

$x \Delta x = x^2 \Rightarrow$ **$(N \Delta R)^{-2} = ?$**

A) C B) A C) N D) E E) R

16. $a \Delta b = \min(2a, 1 - b)$

$a \square b = \max(a^2, b + 3)$

$\Rightarrow$ **$(2 \Delta 2) \square (2 \square 2) = ?$**

A) 6 B) 8 C) 10 D) 12 E) 14

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1	2	3	4	5	6	7	8
B	D	C	A	C	E	B	D
9	10	11	12	13	14	15	16
E	A	B	C	A	E	D	B

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1. $x \Delta y = x^y - y^x + 2xy$

$\Rightarrow$ **$3 \Delta 2 = ?$**

A) 9 B) 11 C) 13 D) 15 E) 17

2. $x \square y = x + 2y$

$x \Delta y = y - x$

$\Rightarrow$ **$(1 \square 2) \Delta (1 \square 3) = ?$**

A) 2 B) 4 C) 7 D) 9 E) 11

3. $x \Delta y = x^3 - y^3$

$x \square y = x \cdot y - x - y$

$\Rightarrow$ **$(2 \Delta 1) \square (3 \Delta 2) = ?$**

A) 57 B) 68 C) 79 D) 93 E) 107

4. $\dfrac{3}{x \Delta y} = \dfrac{1}{x} - \dfrac{2}{y} \Rightarrow$ **$2 \Delta 5 = ?$**

A) 18 B) 24 C) 30 D) 35 E) 42

5. $x \Delta y = x + 2y - 4$

$2 \Delta m = 8 \Rightarrow$ **$m = ?$**

A) 3 B) 5 C) 6 D) 7 E) 8

6. $x \Delta 2y = xy - y$

$\Rightarrow$ **$3 \Delta 2 = ?$**

A) 1 B) 2 C) 3 D) 5 E) 7

7. $x \Delta y = x^2 - y - 3$

$(3 \Delta 4) \Delta a = 2 \Rightarrow$ **$a = ?$**

A) –2 B) –1 C) 0 D) 1 E) 2

8. $x \Delta y = 2x + 3y$

$a \Delta b = 23,\ b \Delta a = 22 \Rightarrow$ **$a \cdot b = ?$**

A) 14 B) 16 C) 20 D) 25 E) 32

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9. $x \Delta y = 2x + y - 4$

$x ❑ y = x - y + 2xy$

$3 \Delta (2 ❑ a) = 7 \Rightarrow$ **a = ?**

A) –2 B) –1 C) 0 D) 1 E) 2

10. $(3a + b) ❑ (a - 2b) = a^b - b^a + 2$

$\Rightarrow$ **14 ❑ – 7 = ?**

A) 60 B) 80 C) 88 D) 96 E) 120

11. $x ❑ y = y \cdot (y ❑ x) + 5$

$\Rightarrow$ **2 ❑ 3 = ?**

A) –4 B) –3 C) 2 D) 3 E) 4

12. $x \Delta y = x^2 - y^2 + xy,$

$(-1 \Delta 2) \Delta x = 1$

$\Rightarrow \sum x = ?$

A) –9 B) –5 C) –3 D) 5 E) 9

13. $x ❑ y = x^2 - 2xy + y^2$

$1 ❑ a = 16 \Rightarrow \sum a = ?$

A) 2 B) 8 C) 12 D) 16 E) 20

14. $\frac{1}{x} \Delta \frac{1}{y} = 3x + 4y$

$\Rightarrow$ **3 ∆ 2 = ?**

A) 3 B) 5 C) 6 D) 9 E) 12

15. $a ★ b = (x + y)^2 - 4xy$

$\Rightarrow$ **2001 ★ 2003 = ?**

A) 1 B) 3 C) 4 D) 9 E) 16

16. $a ● b = b^a$

$a ■ b = \sqrt[b]{a}$

$\Rightarrow$ **(4 ● 3) ■ 2 = ?**

A) 2 B) 3 C) 6 D) 9 E) 10

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1	2	3	4	5	6	7	8
C	A	E	C	B	B	B	C
9	10	11	12	13	14	15	16
D	E	A	B	A	A	C	D

1. $(x \Delta y) = 2x + 3(y \Delta x)$

$\Rightarrow$ **$-1 \Delta -1 = ?$**

A) –2 B) –1 C) 1 D) 2 E) 3

2. $(2a - b) \Delta (3a + b) = a^2 - ab + b^2$

$\Rightarrow$ **$7 \Delta 13 = ?$**

A) 5 B) 7 C) 9 D) 13 E) 15

3. $a \Delta b = \begin{cases} 2a + b & b \equiv 1 (\text{mod } 2) \\ a^2 - b & b \equiv 0 (\text{mod } 2) \end{cases}$

$\Rightarrow$ **$2 \Delta (3 \Delta 4) = ?$**

A) 4 B) 5 C) 6 D) 9 E) 12

4. $x \Delta y = x + y - 8$

$x \Delta e = e \Delta x = x \Rightarrow$ **$e = ?$**

A) 4 B) 8 C) 10 D) 12 E) 16

5.

Δ	F	E	R	C	A	N
F	C	A	N	F	E	R
E	A	N	F	E	R	C
R	N	F	E	R	C	A
C	F	E	R	C	A	N
A	E	R	C	A	N	F
N	R	C	A	N	F	E

$x \Delta x = x^2 \Rightarrow$ **$(F \Delta A^2) \Delta R = ?$**

A) F B) E C) N D) R E) C

6. $x \Delta e = e \Delta x = x$

$x \Delta x^{-1} = e$

$x \Delta y = x{\cdot}y + 3x + 3y + 6$

$\Rightarrow$ **$4^{-1} = ?$**

A) $-\frac{20}{7}$ B) $-\frac{10}{7}$ C) $\frac{10}{7}$ D) $\frac{17}{7}$ E) $\frac{20}{7}$

7. $5^{123} \equiv x \ (\text{mod } 7) \Rightarrow$ **$x = ?$**

A) 1 B) 2 C) 4 D) 5 E) 6

8. $3^{192} + 3^{194} \equiv x \ (\text{mod } 5) \Rightarrow$ **$x = ?$**

A) 0 B) 1 C) 2 D) 3 E) 4

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9. $47^{171} \equiv x \pmod 7 \Rightarrow$ **x = ?**

A) 1 B) 3 C) 4 D) 5 E) 6

10. $4^{1091} \equiv x \pmod 6 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

11. $5^{2n+1} \equiv x \pmod 8 \Rightarrow$ **x = ?**

A) 2 B) 3 C) 5 D) 6 E) 7

12. $(47)^{4n+3} \equiv x \pmod 5 \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

13. $a = (142)^{142}$

$b = (317)^{317}$

$a \cdot b \equiv x \pmod 5 \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

14. $A = (213)^{214} \Rightarrow$ A | 10, remainder ?

A) 2 B) 3 C) 5 D) 6 E) 9

15. $A = (513)^{242} \Rightarrow$ A | 7, remainder ?

A) 1 B) 2 C) 3 D) 4 E) 5

16. $\left.\begin{array}{l} A = (373)^{100} \\ B = (241)^{100} \end{array}\right\} \Rightarrow$ A+B | 7, remainder ?

A) 1 B) 2 C) 4 D) 5 E) 6

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1	2	3	4	5	6	7	8
C	D	D	B	B	A	E	A
9	10	11	12	13	14	15	16
E	D	C	D	D	E	D	E

1. $-13 \equiv x \pmod 9 \Rightarrow$ **x = ?**

A) 2 B) 4 C) 5 D) 6 E) 7

2. $\begin{array}{r|l} 62 & A \\ \hline 2 & \end{array}$ $\begin{array}{r|l} 107 & A \\ \hline 2 & \end{array}$ $\Rightarrow$ **max(A) = ?**

A) 10 B) 12 C) 15 D) 16 E) 20

3. $A \in N$,

$A = 3k + 2 = 5m + 2 \Rightarrow$ **min(A) = ?**

A) 10 B) 13 C) 14 D) 17 E) 18

4. $\left.\begin{array}{l} 143 \equiv 3 \pmod x \\ 256 \equiv 4 \pmod x \end{array}\right\} \Rightarrow$ **max(x) = ?**

A) 24 B) 28 C) 30 D) 35 E) 42

5. $A = 0! + 1! + 2! + 3! + \ldots + 73!$

$A \equiv x \pmod 5 \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

6. $2x - 1 \equiv 4 \pmod 7$

$x \in Z^+ \Rightarrow$ **min(x) = ?**

A) 1 B) 2 C) 3 D) 5 E) 6

7. $x - y \equiv 3 \pmod 8$

$x \cdot y \equiv 5 \pmod 8$

$x^2 + y^2 \equiv a \pmod 8$

$\Rightarrow$ **a = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

8. $42! - 33! \equiv x \pmod{11} \Rightarrow$ **x = ?**

A) 0 B) 2 C) 5 D) 7 E) 9

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9. $A = \{x \mid 17 < x < 125,\ x \equiv 2 \pmod 3\}$

$B = \{y \mid 23 < y < 147,\ y \equiv 4 \pmod 5\}$

$\Rightarrow$ **$n(A \cap B) = ?$**

A) 3 B) 5 C) 7 D) 9 E) 11

10. $f : Z_{/5} \rightarrow Z_{/5}$

$f(x) = \overline{2}x + \overline{3} \Rightarrow$ **$f(\overline{3}) = ?$**

A) 0 B) 1 C) 2 D) 3 E) 4

11. $f(x)=\begin{cases} 2x+1 & ,x\equiv 1 \pmod 5 \\ 1-x & ,x\equiv 2 \pmod 5 \end{cases} \Rightarrow$ **$f(2)+f(6)=?$**

A) 8 B) 10 C) 12 D) 16 E) 18

12. $(-2)^{1907} \equiv x \pmod 5 \Rightarrow$ **$x = ?$**

A) 0 B) 1 C) 2 D) 3 E) 4

13. $2^{10} + 12^{10} + 52^{10} \equiv x \pmod{10} \Rightarrow$ **$x = ?$**

A) 2 B) 4 C) 5 D) 6 E) 8

14. $57^{1988} \equiv x \pmod 6 \Rightarrow$ **$x = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

15. $x \equiv 3 \pmod 5$

$x \equiv 4 \pmod 6$

$x \equiv 5 \pmod 7$

$\Rightarrow$ **$\min(x) = ?$**

A) 108 B) 120 C) 144 D) 196 E) 208

16. $Z_{/5}$,

$f(x-1)=\dfrac{2x+3}{4} \Rightarrow$ **$f^{-1}(x)=?$**

A) 2x B) 2x + 1 C) 2x + 2 D) 2x + 3 E) 2x + 4

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1	2	3	4	5	6	7	8
C	C	D	B	E	E	A	A
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
C	E	C	C	A	C	E	A

1. $Z_{/8}$,

$3x + 5 \equiv 6 \pmod 8 \Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

2. $f(x) = \begin{cases} 2x+1, & x \equiv 0 \pmod 5 \\ x+1, & x \equiv 1 \pmod 5 \\ 2x-1, & x \equiv 2 \pmod 5 \end{cases}$

$\Rightarrow$ **(fofof)(10) = ?**

A) 40 B) 41 C) 42 D) 43 E) 44

3. $Z_{/5}$,

$x + 2 \equiv 3 \pmod 5 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

4. $1901^{1917} \equiv x \pmod 6 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

5. $2027^{1908} \equiv x \pmod 5 \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

6. $8197^{198} \equiv \ldots\ldots\ldots x \Rightarrow$ **x = ?**

A) 1 B) 3 C) 5 D) 7 E) 9

7. $3^{8k+2} + 6^{8k+4} \equiv x \pmod 5 \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

8. $Z_{/5}$,

$f(x) = \dfrac{x+3}{2} \Rightarrow$ $\mathbf{f^{-1}(x) = ?}$

A) 2x – 1 B) x + 2 C) 2x + 2 D) 3 – 2x E) x – 3

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9. $5^{-1} + 7^{-1} - 2 \cdot 3 \equiv x \pmod 6$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

10. $x^2 + 10x + 24 \equiv 3 \pmod 8$

$\Rightarrow$ **ÇK(SS) = ?**

A) {1, 5} B) {1, 3} C) {3, 5} D) {4, 5} E) {5, 6}

11. $A = \{x \mid 20 < x < 105,\ x \equiv 1 \pmod 5\}$

$B = \{x \mid 15 < x < 120,\ x \equiv 1 \pmod 6\}$

$\Rightarrow$ **$n(A \cap B)$ = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

12. $A = \{x \mid 10 < x < 150,\ x \equiv 4 \pmod 6\}$

$B = \{x \mid 20 < x < 160,\ x \equiv 6 \pmod 8\}$

$\Rightarrow$ **$n(A \cap B)$ = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

13. $f(x) = \begin{cases} x^2 - 1, & x \equiv 1 \pmod 5 \\ x - 3, & x \equiv 3 \pmod 5 \end{cases}$

$g(x) = \begin{cases} x - 5, & x \equiv 0 \pmod 7 \\ x - 3, & x \equiv 1 \pmod 7 \end{cases}$

$\Rightarrow$ **$(fog)(1) + (gof)(6)$ = ?**

A) 1 B) 15 C) 20 D) 25 E) 30

14. $\left(\frac{7}{9}\right)^{-105} \equiv (\text{mod } 5) \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

15. $1^{41} + 2^{41} + 3^{41} + \ldots + 39^{41} \equiv x \pmod{40}$

$\Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

16. $3^x \equiv 6 \pmod 7$

$9 < x < 100 \Rightarrow$ **min(x) = ?**

A) 12 B) 15 C) 18 D) 21 E) 24

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1	2	3	4	5	6	7	8
B	D	A	E	B	E	A	C
9	10	11	12	13	14	15	16
A	A	B	D	D	C	A	B

1. $1215 \equiv x \pmod 6 \Rightarrow$ **$x = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

2. $-1318 \equiv a \pmod 3 \Rightarrow$ **$a = ?$**

A) 1 B) 2 C) 3 D) 4 E) 0

3. $1316 \equiv x \pmod 2$,

$-1915 \equiv y \pmod 5$

$\Rightarrow$ **$x + y = ?$**

A) 0 B) 1 C) 2 D) 3 E) 4

4. $0 < x < 8$,

$x + y \equiv 5 \pmod 8$,

$x - y \equiv 3 \pmod 8$

$\Rightarrow$ **$x = ?$**

A) 1 B) 3 C) 4 D) 5 E) 6

5. $f : Z_{/5} \rightarrow Z_{/5}$,

$f(x) = \overline{2}x + \overline{4} \Rightarrow$ **$f(\overline{6}) = ?$**

A) $\overline{0}$ B) $\overline{1}$ C) $\overline{2}$ D) $\overline{3}$ E) $\overline{4}$

6. $f : Z_{/7} \rightarrow Z_{/7}$,

$f(\overline{3}x + \overline{1}) = \overline{3}x + \overline{4} \Rightarrow$ **$f(\overline{4}) = ?$**

A) $\overline{0}$ B) $\overline{1}$ C) $\overline{2}$ D) $\overline{3}$ E) $\overline{4}$

7. $f : Z_{/6} \rightarrow Z_{/6}$,

$f(x) = x + \overline{1} \Rightarrow$ **$f^{-1}(x) = ?$**

A) $x + \overline{5}$ B) $x + \overline{4}$ C) $x + \overline{3}$ D) $x + \overline{2}$ E) $x + \overline{1}$

8. $f : Z_{/4} \rightarrow Z_{/4}$,

$f(x) = \overline{3}x + \overline{2} \Rightarrow$ **$f^{-1}(x) = ?$**

A) x B) $x + \overline{1}$ C) $3x + 2$ D) $x + \overline{3}$ E) $\overline{2}x + \overline{2}$

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9. $1915^{193} \equiv x \pmod 5 \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

10. $319^{5} \equiv x \pmod 6 \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

11. $129^{6x+1} \equiv a \pmod 5 \Rightarrow$ **a = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

12. $174^{1391} \equiv \ldots\ldots A \Rightarrow$ **A = ?**

A) 0 B) 1 C) 2 D) 6 E) 4

13. $1293^{415} \equiv x \pmod 5 \Rightarrow$ **x = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

14. $A = 0! + 1! + 2! + \ldots\ldots + 1987!,$

$A \equiv x \pmod 5 \Rightarrow$ **x = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

15. $1213^{497} + 1517^{318} \equiv x \pmod 9 \Rightarrow$ **x = ?**

A) 1 B) 3 C) 5 D) 7 E) 8

16. $\mathbf{18^{18} + 19^{19}}$

sayısının 5 ile bölümünden kalan kaçtır?

What is the remainder when the number $18^{18} + 19^{19}$ divided by 5?

A) 1 B) 2 C) 3 D) 4 E) 5

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1	2	3	4	5	6	7	8
C	B	A	C	B	A	A	C
9	10	11	12	13	14	15	16
A	B	E	E	C	A	C	C

1. $Z_{/7}$,
$x + 5 \equiv 3 \pmod 7 \Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

2. $2013^{1923} \equiv x \pmod 9 \Rightarrow$ **x = ?**

A) 0 B) 1 C) 3 D) 6 E) 8

3. $f(x) = \begin{cases} 3x - 1 & x \equiv 0 \pmod 2 \\ x + 1 & x \equiv 1 \pmod 2 \end{cases}$

$g(x) = \begin{cases} 4x + 1 & x \equiv 0 \pmod 3 \\ x^2 - 1 & x \equiv 1 \pmod 3 \\ 3x + 1 & x \equiv 2 \pmod 3 \end{cases}$

$\Rightarrow$ **(gof)(5) + (fog)(5) = ?**

A) 68 B) 70 C) 72 D) 74 E) 78

4. $\left(-\frac{2}{3}\right)^{55} \equiv x \pmod 4 \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) $\frac{2}{3}$

5. $(107)^{-84} \equiv x \pmod 7 \Rightarrow$ **x = ?**

A) 0 B) 1 C) 3 D) 4 E) 6

6. $Z_{/8}$,
$x + 7 \equiv 3 \pmod 8 \Rightarrow$ **x = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

7. $3x + 4 \equiv 1 \pmod 5 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

8. $f(x) = \begin{cases} x^2 - 2, & x \equiv 0 \pmod 3 \\ 2x + 3, & x \equiv 1 \pmod 3 \\ 3x - 1, & x \equiv 2 \pmod 3 \end{cases}$

$\Rightarrow$ **(fofof)(3) = ?**

A) 48 B) 49 C) 50 D) 51 E) 52

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9. $Z_{/5} \to Z_{/5}$,
$f(x) = 2x + 1$, $(fog)(x) = x + 4 \Rightarrow$ **g(4) = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

10. $Z_{/7} \to Z_{/7}$,
$f(x) = 2x + 3 \Rightarrow$ **$f^{-1}(x)$ = ?**

A) 4x + 2 B) 4x + 3 C) 4x + 4 D) 4x + 5 E) 4x + 6

11. $(3x + 4)\cdot(2x + 1) \equiv 4 \pmod 5 \Rightarrow$ **ÇK(SS) = ?**

A) {0, 2} B) {0, 3} C) {0, 4} D) {1, 3} E) {1, 4}

12. $(2011)^{6n+5} \equiv x \pmod 7 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

13. $5^{-1} + 3^{-1} + 2^5 + 5^2 \equiv x \pmod 8 \Rightarrow$ **x = ?**

A) 1 B) 3 C) 4 D) 6 E) 7

14. $\left(\frac{4}{7}\right)^{-75} \equiv x \pmod 7 \Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 0

15. $6^{20x+3} \equiv x \pmod{11}$
$\Rightarrow$ **x = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

16. $(19197)^2\cdot(1923)^3 \equiv x \pmod 9$
$\Rightarrow$ **x = ?**

A) 0 B) 3 C) 4 D) 5 E) 7

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1	2	3	4	5	6	7	8
D	A	C	A	B	B	D	C
9	10	11	12	13	14	15	16
B	A	C	D	A	E	C	A

1. $\left(\frac{a+7}{3}\right)\Delta\left(\frac{a+b}{3}\right)=a^2-b^2$

$\Rightarrow$ **4Δ3 = ?**

A) 2 B) 3 C) 5 D) 7 E) 9

[ATATÜRK ÜNİVERSİTESİ – YÖS 2017]

2. $95 < x < 102$

$5^x \equiv 3 \pmod 7 \Rightarrow$ **x = ?**

A) 97 B) 98 C) 99 D) 100 E) 101

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

3. **I.** $x\blacktriangle y=\begin{cases} y-x, & |x|>|y| \\ x-y, & |x|=|y| \\ 2(x+y), & |x|<|y| \end{cases}$

II. $[(1\blacktriangle(-1))\blacktriangle(3\blacktriangle 0)]=?$

A) –2 B) –1 C) 0 D) 1 E) 2

[SÜLEYMAN DEMIREL ÜNİVERSİTESİ – YÖS 2017]

4. $a\ \Delta\ b=a^2+2b-ab$

$a\ \square\ b=b^2+2a-ab$

$\Rightarrow$ **(1 Δ 0) □ [1 Δ (–1)] = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

[BALIKESİR ÜNİVERSİTESİ – YÖS 2017]

5. $(2017)^{2016} \equiv x \pmod{13} \Rightarrow$ **x = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

[BALIKESİR ÜNİVERSİTESİ – YÖS 2017]

6. $k \in Z^+$

$5\cdot(8)^{4k+2016} \equiv x \pmod 6 \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

[YILDIZ TEKNİK ÜNİVERSİTESİ – ÜYÖS 2016]

7. $m\ \Delta\ n = 7m - 3n - 5$

$x\ \Delta\ x = x \Rightarrow$ **x = ?**

A) $\frac{5}{3}$ B) $\frac{3}{2}$ C) $\frac{5}{4}$ D) $\frac{3}{4}$ E) $\frac{7}{2}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

8. $\mathbf{6^{2n+4}+2^{3n+2}+6 \equiv ? \pmod 7}$

A) 2 B) 3 C) 4 D) 5 E) 6

[AKDENİZ ÜNİVERSİTESİ – YÖS 2013]

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9. $x + y \equiv 6 \pmod 7$
$3x - y \equiv 2 \pmod 7$
$x - y \equiv ?\ (\text{mod}7)$

A) 2 B) 2 C) 4 D) 5 E) 6

[AKDENİZ ÜNİVERSİTESİ – YÖS 2013]

10. $\frac{3}{x} \Delta \frac{y}{2} = 6x - y + 5$
$6\Delta a = 14 \Rightarrow$ **a = ?**

A) $\frac{3}{2}$ B) $\frac{1}{2}$ C) –2 D) $-\frac{5}{2}$ E) –3

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

11. $\sqrt{a \blacksquare b} = \sqrt{a} + \sqrt{b}$

$\frac{1}{a \Delta b} = \frac{1}{a} + \frac{1}{b}$

$\Rightarrow$ **$(1 \blacksquare 4) \Delta 9 = ?$**

A) $\frac{2}{9}$ B) $\frac{4}{9}$ C) 1 D) $\frac{9}{4}$ E) $\frac{9}{2}$

[İSTANBUL ÜNİVERSİTESİ – YÖS 2015]

12. $a \blacksquare b = a + b$

$a \Delta b = \begin{cases} a, & a \cdot b < 0 \\ -b, & a \cdot b \geq 0 \end{cases}$

$\Rightarrow$ **$(2 \Delta 1) \blacksquare (2 \Delta (-1)) = ?$**

A) –2 B) –1 C) 0 D) 1 E) 2

[GİRESUN ÜNİVERSİTESİ – YÖS 2014]

13. $333^{2013} \equiv x \pmod{10} \Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2013]

14. $m \Delta n = (m + n)^2 - (m - n)^2$

$\Rightarrow$ **$\sqrt{2} \Delta [\sqrt{2} \Delta (\sqrt{2} \Delta \sqrt{2})] = ?$**

A) 2^3 B) 12 C) 16 D) 2^8 E) 512

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2013]

15. $(x,y) \Delta (z,t) = (x \cdot t - z,\ \ y \cdot t + z)$

$(m,n) \Delta (5,1) = (-3,7) \Rightarrow$ **m + n = ?**

A) –3 B) –2 C) 1 D) 4 E) 5

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2013]

16. $x \square y = 2x^2 + 4y$

$[2 \square (-1)] \square a = 0 \Rightarrow$ **a = ?**

A) –16 B) –8 C) 8 D) 12 E) 16

[İSTANBUL ÜNİVERSİTESİ – YÖS 2013]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	E	A	D	B	B	A	C
9	**10**	**11**	**12**	**13**	**14**	**15**	**16**
D	E	E	D	C	D	D	B

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BÖLÜM CHAPTER 15

TARİHSEL NOT / HISTORICAL NOTE

Cantor, Georg (Ferdinand Ludwig Philipp) [1845 - 1918]

St. Petersburg'da doğmuş, hayatının büyük bir kısmını Almanya'da Halle Üniversitesi'nde geçirmiştir. 1873'de rasyonal sayılar kümesinin sayılamaz olduğunu göstermiştir. Aynı zamanda reel sayılar kümesinin de sayılamaz sonsuzlukta olduğunu göstermiştir. Daha sonra sonsuz kümeler kuramını geliştirmiştir.

He was born in St Petersburg, but spent most of his life at the University of Halle in Germany. In 1873, he showed that the set of rational numbers is denumerable. He also showed that the set of all real numbers is not. Later he fully developed his theory of infinite sets.

SAYMA İLKELERİ (Permütasyon, Kombinasyon), BİNOM AÇILIMI ve OLASILIK

COUNTING PRINCIPLES (Permutations, Combinations), BINOMIAL EXPANSION and PROBABILTY

Bu bölüm 80 alıştırma sorusu, 112 test sorusu, 16 YÖS sorusu içermektedir.

This chapter includes 80 exercise questions, 112 test questions, and 16 YÖS questions.

BÖLÜM / CHAPTER 1

SAYMA İLKELERİ (PERMÜTASYON, KOMBİNASYON), BİNOM AÇILIMI ve OLASILIK
COUNTING PRINCIPLES (PERMUTATIONS, COMBINATIONS), BINOMIAL EXPANSION and PROBABILITY

- Sayma İlkeleri (Permütasyon, Kombinasyon), Binom Açılımı ve Olasılık
  Counting Principles (Permutations, Combinations), Binomial Expansion And Probability . . . . 565 - 594

BÖLÜM 15 CHAPTER

SAYMA İLKELERİ (Permütasyon, Kombinasyon), BİNOM AÇILIMI ve OLASILIK

COUNTING PRINCIPLES (Permutations, Combinations), BINOMIAL EXPANSION and PROBABILITY

Alıştırmalar / Exercises

Permütasyon Kombinasyon Binom Açılımı ve Olasılık / Permutations, Combinations, Binomial Expansion and Probability

1. $C(7,2) = ?$

Yanıt / The Answer is 21

2. $\binom{8}{3} = ?$

Yanıt / The Answer is 56

3. $\binom{5}{2} + \binom{6}{2} = ?$

Yanıt / The Answer is 25

4. $\binom{6}{4} + \binom{7}{4} = ?$

Yanıt / The Answer is 50

5. $\binom{7}{3} + \binom{6}{3} = ?$

Yanıt / The Answer is 55

6. $\binom{8}{0} + \binom{8}{8} = ?$

Yanıt / The Answer is 2

7. $\binom{n}{1} + \binom{n}{0} = 7 \Rightarrow n = ?$

Yanıt / The Answer is 6

8. $\binom{n}{2} = 10 \Rightarrow n = ?$

Yanıt / The Answer is 5

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9. $\binom{n}{3}=\binom{n}{4} \Rightarrow$ n = ?

Yanıt / The Answer is 7

10. $\binom{x}{3n-1}=\binom{x}{2n+4} \Rightarrow$ n = ?

Yanıt / The Answer is 5

11. $\binom{10}{2x}=\binom{10}{x+4} \Rightarrow \sum x$ = ?

Yanıt / The Answer is 6

12. $\binom{n}{0}+\binom{n}{1}+\binom{n}{2}=16 \Rightarrow$ n = ?

Yanıt / The Answer is 5

13. $\binom{6}{1}+\binom{6}{2}+\binom{6}{3}+\binom{6}{4}+\binom{6}{5}$ = ?

Yanıt / The Answer is 62

14. P(5,3) = ?

Yanıt / The Answer is 60

15. P(4,3) + P(6,2) = ?

Yanıt / The Answer is 54

16. P(7,2) + C(8,2) = ?

Yanıt / The Answer is 70

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17. $\binom{8}{3} = P(n,2) \Rightarrow$ **n = ?**

Yanıt / The Answer is 8

18. $P(n,4) = 90 \cdot 8 \cdot 7 \quad \Rightarrow$ **n = ?**

Yanıt / The Answer is 10

19. $P(n,5) = 110 \cdot 72 \cdot 7 \quad \Rightarrow$ **n = ?**

Yanıt / The Answer is 11

20. $P(n,2) = \binom{n}{3} \Rightarrow$ **n = ?**

Yanıt / The Answer is 8

21. $\frac{1}{7} \cdot P(7,5) - \frac{1}{5} \cdot P(5,3) = ?$

Yanıt / The Answer is 348

22. $P(n,1) - 16 = 0 \quad \Rightarrow$ **n = ?**

Yanıt / The Answer is 16

23. $P(n,2) - 12 = 0 \quad \Rightarrow$ **n = ?**

Yanıt / The Answer is 4

24. $\frac{P(n,3)}{P(n,1)} = n^2 - 4n + 7 \Rightarrow$ **n = ?**

Yanıt / The Answer is 5

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25. $P(n,2) + P(n,1) = 49 \Rightarrow$ **n = ?**

Yanıt / The Answer is 7

26. $P(n,3) - 5 \cdot P(n,2) = 0 \Rightarrow$ **n = ?**

Yanıt / The Answer is 7

27. $P(8,n) = 56 \Rightarrow$ **n = ?**

Yanıt / The Answer is 2

28. $P(9,n) = 72 \cdot 42 \Rightarrow$ **n = ?**

Yanıt / The Answer is 4

29. $P(12,n) = 132 \cdot 90 \cdot 8 \Rightarrow$ **n = ?**

Yanıt / The Answer is 5

30. $P(n,1) = \binom{n}{3} \Rightarrow$ **n = ?**

Yanıt / The Answer is 4

31. **3 kimya ve 5 matematik kitabı bir rafa yan yana dizilecektir. Kimya kitapları bir arada ve matematik kitapları bir arada olmak şartıyla kaç farklı şekilde dizilebilir?**

3 chemistry and 5 mathematics books are going to be placed in a bookshelf. If the chemistry books are going to be together and mathematics books are also going to be together, these books can be placed in a raw in how many different ways?

Yanıt / The Answer is 2!·3!·5!

32. **Aralarında Ece ve Gürkan'ın bulunduğu 6 kişi yan yana sıralanacaktır. Ece ve Gürkan yan yana olmamak şartı ile kaç farklı şekilde sıralanabilirler?**

6 people including Ece and Gürkan are going to line up next to each other. If Ege and Gürkan can not stand side by side, in how many different ways can these people line up?

Yanıt / The Answer is 480

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33. Anne, baba ve 5 çocuktan oluşan bir aile yuvarlak bir masa etrafında oturacaktır. En küçük çocuk, anne ile babanın arasında oturmak şartı ile kaç farklı şekilde oturabilirler?

A family consisting of 5 kids and the parents are going to sit around a round table. If the youngest kid wants to sit between parents, in how many different ways can the family sit around the table?

Yanıt / The Answer is 48

---

34. "ANKARA" kelimesinin harfleri yer değiştirerek 6 harfli anlamlı ya da anlamsız kaç farklı kelime yazılabilir?

With letters of word "ANKARA", how many different 6 letter words, meaningfull or meaningless, can be written?

Yanıt / The Answer is 120

---

35. 5 kız ve 4 erkek yan yana oturacaktır. Herhangi iki kız yan yana oturmamak şartı ile kaç farklı şekilde oturabilirler?

5 girls and 4 boys are going to sit in a raw, if no two girls are allowed to sit next to each other, in how many different ways can these 9 people sit?

Yanıt / The Answer is 5!·4!

---

36. 55440066 sayısının rakamları yer değiştirerek 8 basamaklı kaç farklı çift sayı yazılabilir?

Using the digits of the number 55440066, how many 8 digit even numbers can be written?

Yanıt / The Answer is 990

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37. 8 kitap arasından 4 kitap kaç farklı şekilde seçilebilir?

In how many different ways can 4 books be chosen from 8 books?

Yanıt / The Answer is 70

---

38. 5 kız, 4 erkek öğrenci arasından, 3 kız, 2 erkek olmak şartı ile 5 kişilik bir çalışma grubu kaç farklı şekilde oluşturulabilir?

From 5 female and 4 male students, a work group of 5 people consisting of 3 female and 2 male students is going to be picked. In how many different ways can this group be selected?

Yanıt / The Answer is 60

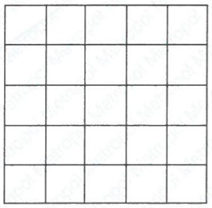
---

39. 6 doktor 7 hemşirenin bulunduğu bir hastanede, en az 3 tane doktor olmak şartı ile 4 kişilik sağlık komisyonu kaç farklı şekilde oluşturulabilir?

In a hospital having 6 doctors and 7 nurses, a health commission of 4 people is going to be formed. If this commission should have at least 3 doctors, in how many different ways can this commission be constituted?

Yanıt / The Answer is 155

40.



⇒ **Şekilde kaç tane dikdörtgen vardır?**

How many rectangles are there in the figure above?

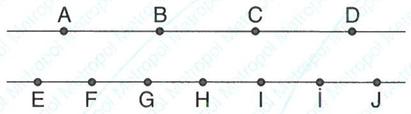
Yanıt / The Answer is 225

41. **Aralarında Marif ve Şamil'in bulunduğu 7 kişi içinden 4 kişilik bir grup oluşturulacaktır. Bu grup, Marif ve Şamil birlikte bulunmamak şartı ile kaç farklı şekilde oluşturulabilir?**

A group of 4 people is going to be picked from 7 people including Marif and Şamil, if this two people should stay toghether, in how many different ways can this group be formed?

Yanıt / The Answer is 10

42.



⇒ **Şekildeki 11 nokta kullanılarak kaç farklı üçgen çizilebilir?**

How many different triangles can be drawn using 11 points in the figure above?

Yanıt / The Answer is 126

---

43. $(x+y)^{10} = \ldots + A \cdot x^3 \cdot y^n + \ldots$

⇒ **n = ?**

Yanıt / The Answer is 7

---

44. $(x+2y)^n = \ldots + A \cdot x^3 \cdot y^4 + \ldots$

⇒ **n = ?**

Yanıt / The Answer is 7

---

45. $(x^2+3y^3)^n = \ldots + A \cdot x^2 \cdot y^6 + \ldots$

⇒ **n = ?**

Yanıt / The Answer is 3

---

46. $(3x^3+2y^4)^n = \ldots + A \cdot x^9 \cdot y^{12} + \ldots$

⇒ **n = ?**

Yanıt / The Answer is 6

---

47. $(x+2)^2 = \ldots + A \cdot x + \ldots$

⇒ **A = ?**

Yanıt / The Answer is 4

---

48. $(x+2)^3 = \ldots + A \cdot x^2 + \ldots$

⇒ **A = ?**

Yanıt / The Answer is 6

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49. $(x+2)^4 = ... + A \cdot x^2 + ...$

$\Rightarrow$ **A = ?**

Yanıt / The Answer is 24

50. $(x+2)^5 = ... + A + ...$

$\Rightarrow$ **A = ?**

Yanıt / The Answer is 32

51. $(2x-1)^5 = ... + m \cdot x^3 + ...$

$\Rightarrow$ **m = ?**

Yanıt / The Answer is 80

52. $(x+y)^9 = ... + A \cdot x^7 \cdot y^2 + ...$

$\Rightarrow$ **A = ?**

Yanıt / The Answer is 36

53. $(2a+5b)^3 = ... + T \cdot a \cdot b^2 + ...$

$\Rightarrow$ **T = ?**

Yanıt / The Answer is 150

54. $x = 10 \; , \; y = -8$

$\Rightarrow$ $\mathbf{x^4 + 4x^3y + 6x^2y^2 + 4xy^3 + y^4 = ?}$

Yanıt / The Answer is 16

55. $x = \sqrt[5]{3} + 1$

$\Rightarrow$ $\mathbf{x^5 - 5x^4 + 10x^3 - 10x^2 + 5x - 1 = ?}$

Yanıt / The Answer is 3

56. $a = \sqrt{2} + 1$

$\Rightarrow$ $\mathbf{a^4 - 4a^3 + 6a^2 - 4a + 3 = ?}$

Yanıt / The Answer is 6

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57. $x=\sqrt{2}-1$

$\Rightarrow$ $\mathbf{x^4+4x^3+6x^2+4x+4=?}$

Yanıt / The Answer is 7

58. $(x-\sqrt{x})^8=\ldots+m\cdot x^5+\ldots$

$\Rightarrow$ **m = ?**

Yanıt / The Answer is 28

59. $(a-2b)^2=\ldots+k\cdot a\cdot b+\ldots$

$\Rightarrow$ **k = ?**

Yanıt / The Answer is –4

60. $(a-2b^3)^4=\ldots+A\cdot a^2\cdot b^6+\ldots$

$\Rightarrow$ **A = ?**

Yanıt / The Answer is 24

61. $\left(x+\frac{1}{x}\right)^2=\ldots+k\cdot x^{-2}+\ldots$

$\Rightarrow$ **k = ?**

Yanıt / The Answer is 1

62. $\left(x-\frac{1}{x}\right)^3=\ldots+p\cdot\frac{1}{x}+\ldots$

$\Rightarrow$ **p = ?**

Yanıt / The Answer is 3

63. $\left(x^2-\frac{2}{x}\right)^6=\ldots+t\cdot x^3+\ldots$

$\Rightarrow$ **t = ?**

Yanıt / The Answer is – 160

64. $\left(x+\frac{2}{x}\right)^3=\ldots+A\cdot x+\ldots$

$\Rightarrow$ **A = ?**

Yanıt / The Answer is 6

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65. $\left(x-\frac{1}{\sqrt{x}}\right)^3 = \ldots + A + \ldots$

$\Rightarrow$ **A = ?**

Yanıt / The Answer is 3

66. $\left(x^2+\frac{2}{x^2}\right)^6 = \ldots + A + \ldots$

$\Rightarrow$ **A = ?**

Yanıt / The Answer is 160

67. $\left(x+\frac{2}{x}\right)^{10} = \ldots + 30 \cdot k \cdot x^6 + \ldots$

$\Rightarrow$ **k = ?**

Yanıt / The Answer is 6

68. $\left(x^2+\frac{1}{x^3}\right)^{10} = \ldots + k + \ldots$

$\Rightarrow$ **k = ?**

Yanıt / The Answer is $\binom{10}{4}$

69. $(a+b-c)^4 = \ldots + K \cdot a \cdot b \cdot c^2 + \ldots$

$\Rightarrow$ **K = ?**

Yanıt / The Answer is 12

70. $(x+y+2z)^5 = \ldots + A \cdot x^2 \cdot y^2 \cdot z + \ldots$

$\Rightarrow$ **A = ?**

Yanıt / The Answer is 60

71. $(2x+y^2-z)^6 = \ldots + A \cdot x^3 \cdot y^4 \cdot z + \ldots$

$\Rightarrow$ **A = ?**

Yanıt / The Answer is –480

72. $(x+y-z)^6 = \ldots + A \cdot x^2 \cdot y^2 \cdot z^2 + \ldots$

$\Rightarrow$ **A = ?**

Yanıt / The Answer is 90

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73. $\binom{6}{0}+\binom{6}{1}+\binom{6}{2}+...+\binom{6}{6}=?$

Yanıt / The Answer is 2^6

74. $\binom{10}{0}+\binom{10}{1}+\binom{10}{2}+...+\binom{10}{10}=?$

Yanıt / The Answer is 2^{10}

75. **Bir torbada 5 mavi, 4 yeşil ve 3 sarı bilye vardır. Geri atılmaksızın çekilen iki bilyeninde yeşil olmama olasılığı kaçtır?**

There are 5 blue, 4 green and 3 yellow marbles in a bag. What is the probability of both marbles in which are going to be taken out of the bag randomely, being green ones?

Yanıt / The Answer is $\frac{14}{33}$

76.

I.	II.
3M 5Y	4M 3Y
I. Torba Bag I	II. Torba Bag II

I. torbada 3 mavi ve 5 yeşil, II. torbada 4 mavi ve 3 yeşil top bulunmaktadır. I. torbadan 1 top çekilip rengine bakılmaksızın II. torbaya atılıyor. II. torbadan çekilen 1 topun yeşil renkli olma olasılığı kaçtır?

There are 3 blue and 5 green balls in bag I, and 4 blue and 3 green balls in bag II. We take out one ball from bag I and throw it to the bag II whithout looking at its color. If we take out a ball from bag II, what is the probability of the ball being green?

Yanıt / The Answer is $\frac{29}{64}$

77. **Atılan bir çift zarın üst yüze gelen sayılarının çarpımının çift sayı olma olasılığı kaçtır?**

Two dices are thrown at the same time. What is the probability of the product of the two numbers which came up being an even number?

Yanıt / The Answer is $\frac{3}{4}$

78. **15 kişilik bir sınıfta bulunan 8 kız öğrencinin 3 tanesi gözlüklüdür. Erkek öğrencilerinde 5 tanesi gözlüklüdür. Buna göre sınıftan seçilen bir öğrencinin erkek veya gözlüksüz olma olasılığı kaçtır?**

A class of 15 students have 8 female students in which 3 are wearing eyeglasses, and from male students of this class 5 are also wearing eyeglasses. If we pick a student randomly from this class, what is the probability of the student being male or wearing eyeglasses?

Yanıt / The Answer is $\frac{4}{5}$

79. **Bir zar ve bir madeni para atılıyor. Zarın üst yüzüne asal sayı ve paranın tura gelme olasılığı kaçtır?**

A dice and a coin are thrown at the same time. What is the probability of the dice comıng up a prime number and the coin coming up heads?

Yanıt / The Answer is $\frac{1}{4}$

80. **Bir zar atılıyor. Üst gelen sayının 2 den büyük olduğu bilindiğine göre üst yüze gelen sayının çift sayı olma olasılığı kaçtır?**

A dice is thrown. If we know that the number that came up is bigger than 2, what is the probability of the number being an even number?

Yanıt / The Answer is $\frac{1}{2}$

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1. $P(6, 3) + P(5, 4) + P(3, 1) = ?$

A) 143 B) 158 C) 192 D) 200 E) 243

2. $P(n, r) = 60 \Rightarrow \max(n) = ?$

A) 5 B) 10 C) 20 D) 30 E) 60

3. $P(7, r) = 42 \Rightarrow r = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

4. $P(n, 1) + n^2 - 6 = 0 \Rightarrow n = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

5. $P(2n+1, 2n) = 120 \Rightarrow n = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

6. $P(x, y) = 120 \Rightarrow \max(x + y) = ?$

A) 5 B) 6 C) 9 D) 120 E) 121

7. $P(n, 5) = 90 \cdot 56 \cdot 6 \Rightarrow n = ?$

A) 7 B) 8 C) 9 D) 10 E) 11

8. $\dfrac{P(n,4)}{P(n,2)} = n^2 - 4n \Rightarrow n = ?$

A) 5 B) 6 C) 7 D) 8 E) 9

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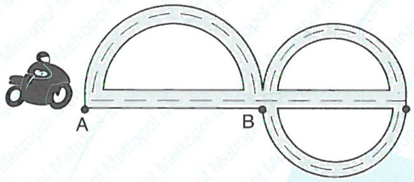
9. **10 kişilik bir matematik öğretmeni grubundan, önce bir zümre başkanı daha sonra da zümre başkan yardımcısı seçilecektir. Bu seçim kaç farklı şekilde yapılabilir?**

From among a group of Mathematics teachers, first the head of department and later assistant head will be selected. In how many different ways can this selection be done?

A) 10 B) 19 C) 81 D) 90 E) 120

10.



Şekildeki hareketli, her seferinde B'den geçmek koşulu ile A noktasından C noktasına kaç farklı şekilde gidebilir?

In how many different ways can the motorcycle rider in the figure travel from point A to point C with passing through point B?

A) 2 B) 4 C) 6 D) 8 E) 10

11. **A = {1, 3, 4, 8} kümesinin elemanları ile 3 basamaklı kaç sayı yazılabilir?**

How many three-digit numbers can be written by using the members of the set A = {1, 3, 4, 8}?

A) 4 B) 12 C) 36 D) 64 E) 128

12. **A = {1, 2, 3, 4, 5} kümesinin elemanları ile <u>rakamları birbirinden</u> farklı 3 basamaklı kaç tane sayı yazılabilir?**

How many three-digit <u>numbers all different from each other</u>, can be written by using the members of the set A = {1, 2, 3, 4, 5}?

A) 15 B) 30 C) 60 D) 70 E) 85

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13. **A = {1, 2, 3, 4, 5} kümesinin elemanları ile <u>rakamları birbirinden farklı</u> 4 basamaklı kaç çift sayı yazılabilir?**

How many four-digit even numbers all different from each other, can be written by using the members of the set A = {1, 2, 3, 4, 5} ?

A) 12 B) 16 C) 20 D) 24 E) 48

14. **5 kişi yuvarlak bir masa etrafında kaç farklı şekilde oturabilir?**

In how many different ways can 5 persons sit around a round table?

A) 12 B) 16 C) 18 D) 24 E) 48

15. **"METROPOL" sözcüğündeki harflerin yerleri değiştirilerek, anlamlı ya da anlamsız kaç sözcük yazılabilir?**

How many different meaningful or meaningless words can be written by using the letters of the word 'METROPOL'?

A) 19180 B) 19800 C) 20160 D) 20180 E) 20260

16. **5 sayı tabanını göstermek üzere $(xyz)_5$ olacak şekilde üç basamaklı kaç sayı yazılabilir?**

How many different three-digit numbers can be formed with the base as five?

A) 120 B) 108 C) 100 D) 96 E) 72

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
E	E	B	B	B	E	D	B
9	10	11	12	13	14	15	16
D	C	D	C	E	D	C	C

1. $P(4,2)+C(5,2)=2x \Rightarrow \binom{x}{9}=?$

A) 40 B) 45 C) 50 D) 55 E) 60

2. **P(5, 3) – C(5, 3) = ?**

A) 10 B) 20 C) 30 D) 40 E) 50

3. $\binom{10}{x+3}=\binom{10}{2x+1} \Rightarrow x=?$

A) 1 B) 2 C) 3 D) 4 E) 5

4. $\binom{n}{1}+\binom{n}{2}+\ldots+\binom{n}{n}=63 \Rightarrow n=?$

A) 4 B) 5 C) 6 D) 7 E) 8

5. $\binom{n}{3}=56 \Rightarrow n=?$

A) 4 B) 5 C) 6 D) 7 E) 8

6. $\binom{n}{4}=\binom{n}{3} \Rightarrow n=?$

A) 5 B) 6 C) 7 D) 8 E) 9

7. $\binom{7}{1}+\binom{7}{2}+\ldots+\binom{7}{6}=?$

A) 2^6 B) 2^7 C) 2^7-2 D) 2^7-6 E) 2^7-8

8. $\binom{n}{0}+\binom{n}{1}=2n-4 \Rightarrow n=?$

A) 1 B) 2 C) 3 D) 4 E) 5

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9. **Bir hastanede çalıştırılmak üzere 3 doktor, 2 hemşire ve 4 hasta bakıcı içerisinden 1 doktor, 1 hemşire ve 2 hasta bakıcı kaç farklı şekilde seçilebilir?**

In how many different ways can 1 doctor, 1 nurse and 1 caregiver be accepted for a job in a hospital from among 3 doctors, 2 nurses and 4 caregiver?

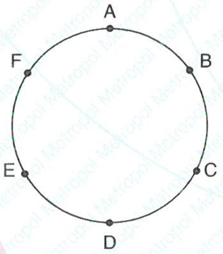
A) 8 B) 12 C) 24 D) 36 E) 48

10. **6 öğrencinin katıldığı bir matematik sınavı, başarı yönünden kaç farklı şekilde sonuçlanabilir?**

In how many different ways the results of a math test applied to 6 students can be in manner of pass or fail?

A) 16 B) 24 C) 32 D) 64 E) 90

11.

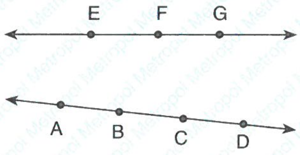


Şekildeki çemberin üzerinde bulunan 6 nokta kullanılarak kaç farklı üçgen çizilebilir?

How many different triangles can be drawn with using the 6 points on the circle in the figure above as the edges of triangles?

A) 6 B) 9 C) 12 D) 18 E) 20

12.



Şekilde verilen doğrular üzerindeki noktalar kullanarakkaç farklı üçgen çizilebilir?

How many different triangles can be drawn with using the points on the lines in the figure as the edges of triangles?

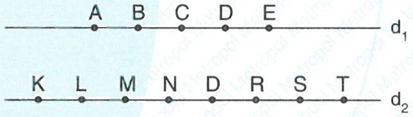
A) 32 B) 30 C) 28 D) 26 E) 24

13. **10 soruluk bir sınavda öğrencilerin 6 soruyu çözmesi isteniyor. Buna göre, sınava giren bir öğrenci kaç farklı seçim yapabilir?**

In an examination comprising of 10 questions, students must solve 6 questions out of 10 in a test. According to that how many different choices can be made by a student who takes the test?

A) 180 B) 190 C) 200 D) 210 E) 220

14.



$d_1 // d_2$, d_1 doğrusu üzerinde 5 farklı nokta, d_2 doğrusu üzerinde 8 farklı nokta vardır. Bu 13 nokta ile kaç farklı üçgen oluşturulabilir?

There are 5 different points on the line d_1, there are 8 different points on the line d_2 and $d_1 \parallel d_2$. How many different triangles can be drawn by using these 13 points?

A) 180 B) 190 C) 200 D) 210 E) 220

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
D	E	B	C	E	C	C	E
9	10	11	12	13	14		
D	D	E	B	D	E		

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1. $P(n, 3) = 60 \Rightarrow$ **n = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

2. $P(n, 3) : P(n, 2) = 20 \Rightarrow$ **n = ?**

A) 18 B) 19 C) 20 D) 21 E) 22

3. $P(n, 0) + P(n, 1) + P(n, 2) = 10 \Rightarrow$ **n = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

4. $P(n, 3) = 20 \cdot P(n, 1) \Rightarrow$ **n = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

5. $C(8,5) + \binom{8}{3} = ?$

A) 96 B) 106 C) 108 D) 112 E) 120

6. $\binom{n}{0} + \binom{n}{n} = x \Rightarrow C(5, x) = ?$

A) 5 B) 8 C) 10 D) 15 E) 18

7. $\binom{5}{0} + \binom{5}{1} + \ldots + \binom{5}{5} = ?$

A) 16 B) 20 C) 24 D) 30 E) 32

8. $\binom{14}{2x} = \binom{14}{x+2} \Rightarrow \sum x = ?$

A) 6 B) 7 C) 8 D) 9 E) 10

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $\frac{1}{5} \cdot P(5,4) - \frac{1}{3} \cdot P(3,2) = ?$

A) 20 B) 22 C) 24 D) 26 E) 28

10. **"SERRA" sözcüğünün harfleri ile anlamlı ya da anlamsız 5 harfli kaç farklı sözcük yazılabilir?**

How many arrangenments can be made from the letters of the word 'SERRA' when all are taken at a time?

A) 30 B) 45 C) 48 D) 60 E) 72

11. **A = {0, 3, 5, 7, 8} kümesinin elemanları ile rakamları birbirinden farklı 3 basamaklı kaç sayı yazılabilir?**

How many three-digit numbers all different from each other, can be written by using the members of the set A = {0, 3, 5, 7, 8}?

A) 32 B) 45 C) 48 D) 54 E) 60

12. **A = {0, 1, 2, 3, 4, 5} kümesinin elemanları ile rakamları farklı 4000'den büyük 4 basamaklı kaç sayı yazılabilir?**

How many four-digit numbers which are greater than 4000, can be written by using the members of the set A = {0,1, 2, 3, 4, 5}?

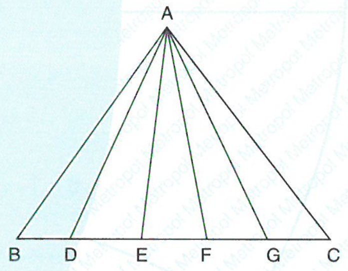
A) 60 B) 80 C) 100 D) 112 E) 120

13. **10 avcının katıldığı bir hedefi vurma yarışmasında sonuç kaç farklı şekilde olabilir?**

10 hunters participated in a shooting contest. How many different results may appear?

A) 2^8 B) 2^{10} C) 2^{12} D) 2^{14} E) 2^{16}

14.



⇒ **Yukarıdaki şekilde kaç tane üçgen vardır?**

How many triangles are there in the figure?

A) 8 B) 10 C) 12 D) 15 E) 18

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	E	A	C	D	C	E	A
9	10	11	12	13	14		
B	D	C	E	B	D		

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1. $(x+y)^n = ... + Ax^3y^2 + ... \Rightarrow$ **n = ?**

A) 1 B) 3 C) 5 D) 7 E) 9

2. $(x-y)^k = ... + Axy^4 + ... \Rightarrow$ **k = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

3. $(x-1)^4 + (x-1)^5 = ... + Tx^3 + ... \Rightarrow$ **T = ?**

A) 4 B) 6 C) 9 D) 10 E) 11

4. $(x+1)^n = ... + 6x^2 + ..., \Rightarrow$ **n = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

5. $(x^2+2y)^n = ... + Ax^4y + ... \Rightarrow$ **n = ?**

A) 7 B) 5 C) 3 D) 2 E) 1

6. $(4x^2 + y)^3 = A \cdot x^6 + B \cdot x^4 \cdot y + C \cdot x^2 \cdot y^2 + D \cdot y^3$

$\Rightarrow$ **A + B + C + D = ?**

A) 32 B) 64 C) 75 D) 100 E) 125

7. $(x + 2y)^5 = ... + A \cdot x^2 \cdot y^3 + ... \Rightarrow$ **A = ?**

A) –80 B) 70 C) 60 D) –60 E) 80

8. $(x + y)^6 = ... + A \cdot x^4y^2 + ... \Rightarrow$ **A = ?**

A) 15 B) 20 C) –15 D) –25 E) –20

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9. $(x+y)^7 = \ldots + A \cdot x^5 y^n + \ldots \Rightarrow$ **A + n = ?**

A) 20 B) 23 C) 24 D) 25 E) 26

10. $(x-y)^5 = \ldots + Ax^2y^3 + \ldots \Rightarrow$ **A = ?**

A) –20 B) –10 C) –5 D) –1 E) 0

11. $(x+y)^n = \ldots + Ax^2y^2 + \ldots \Rightarrow$ **n + A = ?**

A) 5 B) 10 C) 15 D) 20 E) 25

12. $(x^2+Ay^n)^6 = \ldots + 160 \cdot x^6y^9 + \ldots \Rightarrow$ **A + n = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

13. $(1-\sqrt{2})^5 = A + B\sqrt{2} \Rightarrow$ **A + B = ?**

A) 12 B) 15 C)18 D) 21 E) 24

14. $\left(x-\frac{1}{x}\right)^4 = \ldots + Ax^2 + \ldots \Rightarrow$ **A = ?**

A) –5 B) –4 C) 20 D) 4 E) –20

15. $\left(x+\frac{1}{x}\right)^6 = \ldots + A + \ldots \Rightarrow$ **A = ?**

A) 10 B) 20 C) 30 D) 40 E) 50

16. $\left(\frac{2}{x}-x^2\right)^7 = \ldots + A \cdot x^8 + \ldots \Rightarrow$ **A = ?**

A) 84 B) 48 C) 28 D) –48 E) –84

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	A	B	A	C	E	E	A
9	10	11	12	13	14	15	16
B	B	B	E	A	B	B	E

1. $(x-2)^6 = Ax^6 + Bx^5 + Cx^4 + Dx^3 + Ex^2 + Fx + K$
$\Rightarrow$ **C = ?**

A) 30 B) 60 C) 90 D) 120 E) 180

2. $\left(2x-\frac{1}{x}\right)^{10} = ... + Cx^{-6} + ... \Rightarrow$ **C = ?**

A) 100 B) 180 C) 260 D) 340 E) 400

3. $\left(x^2-\frac{1}{x}\right)^6 = ... + C + ... \Rightarrow$ **C = ?**

A) 5 B) −10 C) 15 D) −20 E) 25

4. $\left(x^2+\frac{1}{x}\right)^6 = ... + A + ... \Rightarrow$ **A = ?**

A) 10 B) 15 C) 18 D) 20 E) 24

5. $\left(\frac{1}{x^2}-2x\right)^6 = ... + A + ... \Rightarrow$ **A = ?**

A) −240 B) −120 C) −60 D) 120 E) 240

6. $\left(x^2-\frac{2}{\sqrt{x}}\right)^6 = ... + Ax^7 + ... \Rightarrow$ **A = ?**

A) −120 B) −80 C) 60 D) 80 E) 120

7. $\left(\sqrt{x}+\frac{1}{\sqrt{x}}\right)^6 = ... + Ax + ... \Rightarrow$ **A = ?**

A) 15 B) 8 C) 4 D) 1 E) 3

8. $\left(\sqrt{x}+\frac{1}{\sqrt{x}}\right)^8 = ... + Ax^{-2} + ... \Rightarrow$ **A = ?**

A) 14 B) 28 C) 35 D) 49 E) 56

METROPOL YAYINLARI • METROPOL PUBLICATIONS

9. $(a+b+c)^3 = ... + m \cdot a^2 \cdot b + ... \Rightarrow$ **m = ?**

A) 3
B) 2
C) 1
D) 0
E) –1

10. $(x-y+z)^n = ... + A \cdot x^2y^2z + ... \Rightarrow$ **A + n = ?**

A) 25
B) 30
C) 35
D) 40
E) 41

11. $(x+y-z^2)^4 = ... + A \cdot x^2yz^2 + ... \Rightarrow$ **A = ?**

A) 11
B) – 6
C) 6
D) 12
E) –12

12. $(x+2y^2-z^3)^5 = ... + A \cdot x^2y^4z^3 + ... \Rightarrow$ **A = ?**

A) –120
B) –60
C) 30
D) 60
E) 120

13. $\left(x-\frac{y}{2}\right)^6 = ... + A \cdot x^3y^3 + ... \Rightarrow$ **A = ?**

A) $-\frac{1}{2}$
B) –1
C) $-\frac{3}{2}$
D) –2
E) $-\frac{5}{2}$

14. $\left.\begin{matrix} x^3+3x^2y=5 \\ 3xy^2+y^3=3 \end{matrix}\right\} \Rightarrow$ **x + y = ?**

A) 2
B) 4
C) 6
D) 8
E) 10

15. $\left.\begin{matrix} x^3+y^3=101 \\ xy(x+y)=8 \end{matrix}\right\} \Rightarrow$ **x + y = ?**

A) 5
B) –5
C) 10
D) 15
E) –15

16. $\left.\begin{matrix} x^3+3xy^2=110 \\ 3x^2y+y^3=102 \end{matrix}\right\} \Rightarrow$ **x – y = ?**

A) 6
B) 5
C) 4
D) 3
E) 2

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YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
B	B	C	B	E	C	A	B
9	10	11	12	13	14	15	16
A	C	E	A	E	A	A	E

1. **Bir kutudaki 15 kalemden 3'ü bozuktur. Bu kutudan rastgele alınan iki kalemin her ikisinin de bozuk olma olasılığı kaçtır?**

3 of the pencils in a pencil box that contains 15 pencils are broken. What is the probability of picking 2 broken pencils when picking two pencils randomly?

A) $\frac{1}{28}$ B) $\frac{1}{27}$ C) $\frac{1}{35}$ D) $\frac{1}{40}$ E) $\frac{1}{42}$

2. **Bir kasadaki elmaların %25'i çürüktür. Kasada 40 elma olduğu bilindiğine göre, kasadan rastgele alınan 2 elmanın her ikisinin de sağlam olma olasılığı kaçtır?**

25 percent of the apples in a box are spoiled. If there are 40 apples in that box, what is the probability of picking two unspoiled apples when picking two apples randomly?

A) $\frac{29}{40}$ B) $\frac{9}{16}$ C) $\frac{8}{27}$ D) $\frac{15}{39}$ E) $\frac{29}{52}$

3. **Bir avcının X hedefini vurma olasılığı 1/2, aynı avcının Y hedefini vurma olasılığı 1/3'tür. Buna göre bu avcının iki atışta X ve Y hedeflerini vurma olasılığı kaçtır?**

The probability of hitting the target X for a hunter is 1/2, the probability of hitting the target Y for the same hunter is 1/3. What is the probability for this hunter to hit the the target X and the target Y when he shoots twice?

A) $\frac{5}{6}$ B) $\frac{2}{3}$ C) $\frac{1}{2}$ D) $\frac{1}{4}$ E) $\frac{1}{6}$

4. **Aralarında Begüm ve Serra'nın bulunduğu 5 kişi yan yana sıralanacaktır. Begüm ve Serra'nın yan yana olma olasılığı kaçtır?**

A group that includes Begüm and Serra will stand in a line. What is the probability of standing side by side for Begüm and Serra?

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{1}{6}$ E) $\frac{5}{6}$

5. **Anne, baba ve 3 çocuktan oluşan bir aile yuvarlak bir masa etrafında rastgele oturacaklardır. Buna göre, anne ile babanın yan yana oturmuş olma olasılığı kaçtır?**

A family that consists of a mother, a father and 3 kids will be seated around a round table. What is the probability of appearing side by side for mother and father?

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{1}{2}$ D) $\frac{3}{5}$ E) $\frac{3}{4}$

6.

	Gözlüklü (wearing glasses)	Gözlüksüz (not wearing glasses)
Erkek (Male)	3	7
Kız (Female)	1	5

Yukarıdaki tabloda 16 kişilik bir sınıftaki öğrencilerin dağılımı gösterilmiştir. Buna göre, sınıftan rastgele seçilen bir öğrencinin erkek veya gözlüksüz olma olasılığı kaçtır?

The table above shows the distribution of the students of a classroom which has 16 students. According to that what is the probability of picking a male student or a student not wearing glasses when a student from among the classroom picked randomly?

A) $\frac{1}{2}$ B) $\frac{5}{16}$ C) $\frac{5}{8}$ D) $\frac{7}{8}$ E) $\frac{15}{16}$

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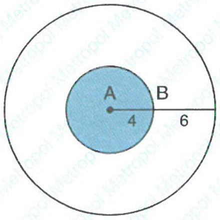
7.



A noktası şekildeki her iki dairenin merkezidir.
IABI = 4 birim, IBCI = 6 birim ve şekli hedef olarak belirleyen bir atıcının ilk atışta hedefi vurduğu biliniyor. Buna göre atıcının küçük daireyi vurmuş olma olasılığı kaçtır?

In the figure above the point A is the center of both circles and IABI = 4, IBCI = 6. It is known that a shooter who accepted the figure as the target, hit the target at the first shoot. What is the probability for this shooter to hit the smaller circle?

A) $\frac{2}{5}$ B) $\frac{4}{15}$ C) $\frac{3}{5}$ D) $\frac{4}{25}$ E) $\frac{9}{25}$

8. **Caner'in bir hedefi vurma olasılığı 1/4'tür. Buna göre iki atış yapan Caner'in hedefi ilk defa ikinci atışta vurma olasılığı kaçtır?**

The probability of hitting the target for Caner is 1/4. What is the probability of hitting the target for the first time at the second shot for him?

A) $\frac{1}{16}$ B) $\frac{1}{8}$ C) $\frac{3}{16}$ D) $\frac{1}{4}$ E) $\frac{1}{2}$

9. **Bir torbada 2 mavi, 4 sarı ve 6 siyah bilye vardır. Buna göre torbadan rastgele seçilen iki bilyenin de renginin sarı olma olasılığı kaçtır?**

There are 2 blue, 4 yellow and 6 black marbles in a pouch. What is the probability of picking 2 yellow marbles when 2 marbles are picked from the pouch randomly?

A) $\frac{1}{12}$ B) $\frac{1}{11}$ C) $\frac{2}{11}$ D) $\frac{5}{12}$ E) $\frac{3}{11}$

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10. **A = {1, 2, 3, 4, 5, 6, 7, 8, 9} kümesinden rastgele seçilen bir sayının asal sayı veya 6'dan küçük olma olasılığı kaçtır?**

What is the probability of choosing a number which is equal to six or smaller than six from the set A = {1, 2, 3, 4, 5, 6, 7, 8, 9}?

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$ E) $\frac{3}{4}$

11. **İki zar atıldığında üst yüze gelen sayılar toplamının 6 olma olasılığı kaçtır?**

What is the probability of getting two numbers that add up to 6 when 2 dice are rolled?

A) $\frac{1}{12}$ B) $\frac{1}{9}$ C) $\frac{5}{36}$ D) $\frac{1}{6}$ E) $\frac{7}{36}$

12. **Bir zar atıldığında üst yüze asal sayı geldiği bilindiğine göre, çift sayı gelme olasılığı kaçtır?**

What is the probability of getting an even number if getting a prime number is known when a dice is rolled?

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) $\frac{1}{6}$

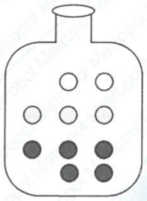
YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
C	E	E	B	C	E	D	C	B	D	C	B

1. **Bir zar ile bir metal para aynı anda havaya atılıyor. Paranın tura ve zarın üst yüzüne 5 gelme olasılığı kaçtır?**
A dice is rolled and a coin is tossed at the same time. What is the probability of getting a head and getting 5?

A) $\frac{1}{12}$ B) $\frac{1}{10}$ C) $\frac{1}{8}$ D) $\frac{1}{6}$ E) $\frac{1}{4}$

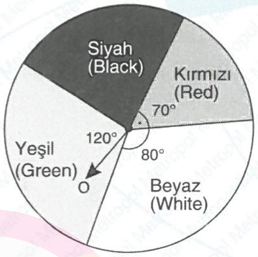
2.



Bir kavanozda 5 siyah, 3 sarı ve 2 beyaz renkli bilye vardır. Kavanoza geri atmamak koşulu ile arka arkaya 3 bilye çekiliyor. Bilyelerin farklı renkte olma olasılığı kaçtır?
There are 5 black, 3 yellow, and 2 white marbles in a jar. 3 marbles are picked consecutively with the condition of not putting back in the jar. What is the probability of getting all the marbles with the same color?

A) $\frac{1}{10}$ B) $\frac{1}{9}$ C) $\frac{1}{6}$ D) $\frac{1}{4}$ E) $\frac{1}{3}$

3.



Bir atıcı şekildeki O merkezli daireyi her atışta vurabiliyor. İki atış yapan bu atıcının her iki atışta da siyah renkli daire dilimini vurma olasılığı kaçtır?
A shooter can shoot the disc that has the center O in the figure, each time he tries. What is the probability of shooting the black painted area at each 2 shots?

A) $\frac{1}{16}$ B) $\frac{1}{9}$ C) $\frac{2}{9}$ D) $\frac{1}{6}$ E) $\frac{2}{3}$

4. **Bir çift zar atılıyor. Her iki zarın üst yüzüne de asal sayı gelme olasılığı kaçtır?**
2 coins are tossed. What is the probability of getting 2 prime numbers?

A) $\frac{1}{12}$ B) $\frac{1}{10}$ C) $\frac{1}{8}$ D) $\frac{1}{6}$ E) $\frac{1}{4}$

5. **Bir torbaya 1'den 10'a kadar numaralandırılmış 10 top konuyor. Rastgele seçilen bir topun çift ya da 5'ten küçük sayılı gelme olasılığı kaçtır?**
10 balls that enumerated from 1 to 10, are put in a pouch. What is the probability of getting a number equal to or smaller than 5 when a ball is picked randomly?

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{1}{2}$ D) $\frac{9}{10}$ E) $\frac{7}{10}$

6. **5 tane metal para aynı anda kavaya atıldığında 2'sinin yazı 3'ünün tura gelme olasılığı kaçtır?**
What is the probability of getting 2 heads and 3 tails when 5 coins are tossed at the same time?

A) $\frac{1}{16}$ B) $\frac{1}{8}$ C) $\frac{3}{16}$ D) $\frac{1}{4}$ E) $\frac{5}{16}$

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7. **A = {N, İ, L, Ü, F, E, R} kümesinin alt kümelerinin tamamı aynı büyüklükte birer karta yazılıp bir torbaya atılıyor. Bu torbadan rastgele çekilen bir kartın üzerinde 3 harf olma olasılığı kaçtır?**

All of the subsets of the set A = {N,İ,L,Ü,F,E,R} are written on same sized cards and then put in a pouch. What is the probability of getting a card which has 3 letters written on when a card is randomly picked?

A) $\frac{3}{128}$ B) $\frac{7}{128}$ C) $\frac{21}{128}$ D) $\frac{35}{128}$ E) $\frac{43}{128}$

8. **8 evli çift arasından rastgele seçilen 2 kişinin evli olma olasılığı kaçtır?**

What is the probability of choosing a married couple when 2 persons are chosen randomly from among 8 married couple?

A) $\frac{1}{32}$ B) $\frac{1}{16}$ C) $\frac{1}{15}$ D) $\frac{1}{8}$ E) $\frac{2}{9}$

9. **Bir çift zar atılıyor. üst yüzlere gelen sayıların toplamının 8 olma olasılığı kaçtır?**

What is the probability of getting 2 numbers which add up to 8 when 2 dice are tossed?

A) $\frac{1}{12}$ B) $\frac{5}{18}$ C) $\frac{1}{6}$ D) $\frac{5}{36}$ E) $\frac{1}{9}$

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10. **Bir metal para ile bir zar birlikte havaya atılıyor. Paranın tura, zarın tek sayı gelme olasılığı kaçtır?**

A coin is tossed and a dice is rolled at the same time. What is the probability of getting a head and getting an odd number?

A) $\frac{1}{6}$ B) $\frac{1}{4}$ C) $\frac{1}{3}$ D) $\frac{1}{2}$ E) $\frac{5}{12}$

11. **Hilesiz bir zarın 2 yüzü beyaz, 3 yüzü mavi ve 1 yüzü sarıya boyanıyor. Zar peş peşe iki kez atıldığında, her defasında üst yüze beyaz gelme olasılığı kaçtır?**

2 sides of a dice are painted white, 3 sides of a dice are painted blue and one side of a dice is painted yellow. What is the probability of getting white sides at both of the times when a dice is rolled twice?

A) $\frac{1}{18}$ B) $\frac{5}{18}$ C) $\frac{5}{12}$ D) $\frac{1}{9}$ E) $\frac{2}{9}$

12. **Bir zar ile bir metal para aynı anda havaya atılıyor. Zarın üste gelen yüzünün 4 veya 4'ten büyük, paranın ise tura gelme olasılığı kaçtır?**

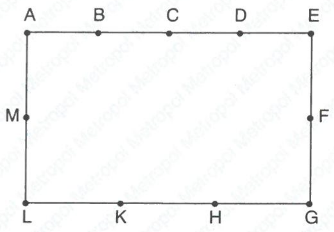
A dice is rolled and a coin is tossed at the same time. What is the probability of getting a number is equal to 4 or greater than 4, and getting a head?

A) $\frac{5}{6}$ B) $\frac{2}{3}$ C) $\frac{1}{3}$ D) $\frac{1}{4}$ E) $\frac{1}{2}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
A	D	A	E	E	E	D	C	D	B	D	D

1.

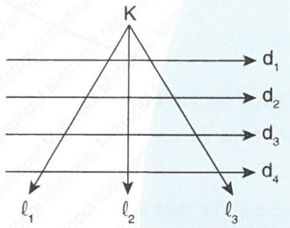


Yukarıdaki dikdörtgen üzerinde verilen 11 noktayı köşe kabul eden kaç üçgen çizilebilir?

How many triangles can be drawn by using 11 points located on the rectangle in the figure as the edges of the triangles?

A) 125 B) 132 C) 142 D) 149 E) 154

2.



Düzlemde bir noktadan geçen 3 doğruyu, birbirine paralel 4 doğru şekildeki gibi kesmiştir. Buna göre, bu şekilde kaç tane yamuk vardır?

3 lines that passes through one point are intersected by 4 parallel lines. According to that, how many trapezoids are there in the figure?

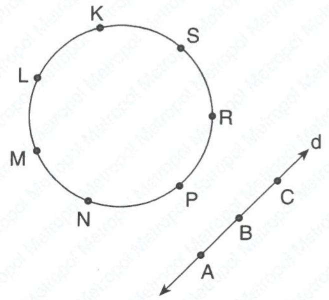
A) 10 B) 12 C) 18 D) 20 E) 24

3. **12 kişilik bir sınıftan, bilgi yarışmasına katılması için üç öğrenci seçilecektir. Bu seçim kaç farklı şekilde yapılabilir?**

3 students will be chosen from among a class of 12 students to participate in a knowledge contest. In how many ways can this selection be done?

A) 180 B) 200 C) 210 D) 220 E) 230

4.

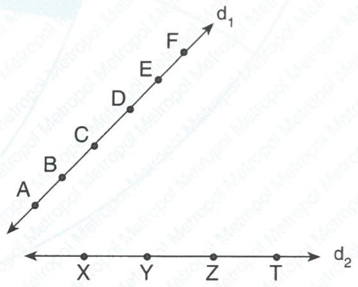


Yukarıdaki şekilde, çember üzerinde 7 nokta ile çemberi kesmeyen doğru üzerinde 3 nokta veriliyor. Köşeleri bu 10 noktadan üçü olan kaç farklı üçgen çizilebilir?

7 points located on a circle and 3 points located on a line that does not intersect the circle is given above in the figure. How many different triangles can be drawn by using these 10 points as the edges of the triangles?

A) 96 B) 114 C) 119 D) 124 E) 127

5.



d_1 doğrusu üzerinde 6, $d_2$doğrusu üzerinde 4 nokta veriliyor. Köşeleri bu noktalar olan kaç üçgen çizilebilir?

There are 6 points located on the line d_1 and 4 points located on the line d_2 are given in the figure above. How many triangles can be drawn by using these points as the edges of the triangles?

A) 96 B) 104 C) 108 D) 110 E) 118

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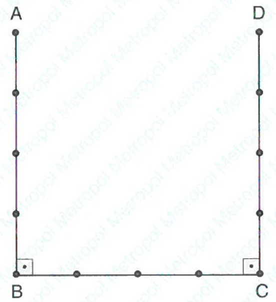
6.



Şekilde [AB] ⊥ [BC], [BC] ⊥ [CD] dir. Köşeleri şekildeki noktalardan oluşan kaç farklı dik üçgen çizilebilir?

In the figure above, AB ⊥ BC and BC ⊥ CD. How many right triangles can be drawn by using these points as the edges of the triangles?

A) 24 B) 32 C) 36 D) 42 E) 48

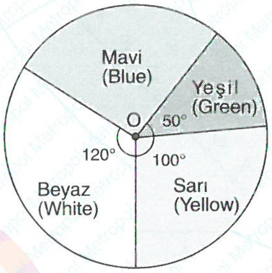
7.

Şekildeki eş karelerden 6 tanesi sarı diğerleri mavi olmak üzere kareler rastgele boyanırsa, kaç farklı görüntü oluşur?

From among six identical squares having equal sides, how many different types of figures can be obtained randomly?

A) 924 B) 954 C) 968 D) 1008 E) 1024

8.



Şekildeki O merkezli dairesel hedef tahtasını her atışta vuran bir atıcının ilk atışta mavi bölmeyi vurma olasılığı kaçtır?

What is the probability of shooting the blue painted area for a shooter that shoots the circle formed target in the figure each time he tries?

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{2}{5}$ D) $\frac{3}{5}$ E) $\frac{3}{4}$

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9. E = {A, B, C},

$P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ ⇒ **P(C) = ?**

A) $\frac{1}{12}$ B) $\frac{1}{9}$ C) $\frac{1}{8}$ D) $\frac{1}{6}$ E) $\frac{1}{3}$

10. Bir avcının hedefi vurma olasılığı 2/7 ise bu avcının hedefi vuramama olasılığı kaçtır?

If the probability of a hunter's hitting the target is 2/7, what is the probability of him not hitting the target?

A) $\frac{2}{7}$ B) $\frac{3}{7}$ C) $\frac{4}{7}$ D) $\frac{5}{7}$ E) $\frac{6}{7}$

11. Bir madeni para ile bir zar aynı anda havaya atılıyor. Buna göre, paranın tura ve zarın 4'ten büyük gelme olasılığı kaçtır?

A coin is tossed and a dice is rolled at the same time. What is the probability of getting a head and getting a number greater than 4?

A) $\frac{1}{24}$ B) $\frac{1}{18}$ C) $\frac{1}{12}$ D) $\frac{1}{9}$ E) $\frac{1}{6}$

12. $P(A) = \frac{3}{4}$, $P(B) = \frac{1}{4}$, $P(A \cup B) = \frac{4}{5}$ ⇒ **$P(A \cap B) = ?$**

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{1}{4}$ E) $\frac{3}{4}$

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12
D	C	D	C	A	B	A	A	D	D	E	A

1. $\dfrac{9!-8!}{7!+6!}=?$

A) 52 B) 54 C) 56 D) 58 E) 60

[KARADENİZ TEKNİK ÜNİVERSİTESİ – YÖS 2018]

2. **Anne, baba ve 4 çocuktan oluşan bir aile yuvarlak masa etrafında yemek yiyeceklerdir. Buna göre anne ve babanın arasına en küçük çocuk oturmak şartı ile kaç farklı şekilde yemek yiyebilirler?**

A family consisting of mom, dad, and their 4 children are going to eat food on a round table. Accordingly, in how many different ways can the family sit around the table if the youngest child sits between mom and dad?

A) 24 B) 16 C) 14 D) 12 E) 10

[FIRAT ÜNİVERSİTESİ – YÖS 2018]

3. $\binom{4}{0}\cdot 2^4+\binom{4}{1}\cdot 2^3+\binom{4}{2}\cdot 2^2+\binom{4}{3}\cdot 2^1+\binom{4}{4}\cdot 2^0=?$

A) 2^3 B) 4^3 C) 3^4 D) 3^5 E) 4^4

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2018]

4. $n!=n\cdot(n-1)\cdot(n-2)\ \dots\ 3\cdot 2\cdot 1$

$\dfrac{(n+2)!}{n!}=15-\dfrac{(n+1)!}{n!}\Rightarrow$ **n = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

[ATATÜRK ÜNİVERSİTESİ – YÖS 2017]

5. **4 kişinin düz bir masaya sıralanma sayısı a, yuvarlak bir masaya sıralanma sayısı b olduğuna göre a + b kaçtır?**

The number of ways 4 people can sit in a raw ın a table is a and the number of ways these people can sit around a round table is b. Accordingly, what is a + b?

A) 8 B) 30 C) 48 D) 120 E) 144

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2017]

6. **10 takımdan oluşan bir ligde her takım diğer takımların her biriyle yalnızca bir maç yaparsa toplam kaç maç yapmış olur?**

In a league with 10 teams if each team plays a single mach with every other team of the league, how many games will be played in total?

A) 5 B) 20 C) 45 D) 55 E) 60

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2017]

7. $\binom{n}{r}=\dfrac{n!}{(n-r)!\cdot r!}$

$\Rightarrow \binom{n+1}{n}-\binom{n}{n-1}=?$

A) –n B) –1 C) 0 D) 1 E) n

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

8. $\dfrac{4!\cdot(x-5)!}{5!\cdot(x-6)!}=5!\Rightarrow$ **x = ?**

A) 605 B) 595 C) 125 D) 115 E) 65

[ERCİYES ÜNİVERSİTESİ – YÖS 2017]

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9. $n \in Z^+$

$(x+y)^n = ... + 10x^{n-3}\cdot y^3 + ... \Rightarrow$ **n =**

A) 3 B) 4 C) 5 D) 6 E) 7

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2017]

10. $A = 3x^3 + 2x^2 + ax - 1$

$B = 2x^3 - (2a+1)x^2 + 4x + 1$

$A \cdot B = ... + 2x^4 + ...$

$\Rightarrow$ **a = ?**

A) –2 B) –1 C) 2 D) 4 E) 5

[İSTANBUL ÜNİVERSİTESİ – YÖS 2014]

11. $n! = 1\cdot 2\cdot 3\cdot ... \cdot (n-1)\cdot n$

$$\frac{(n+1)! - n(n-1)!}{n! - (n-1)!} = ?$$

A) $\frac{n}{n-1}$ B) $\frac{n^2}{n-1}$ C) $\frac{1}{n-1}$ D) $\frac{n^2}{n+1}$ E) $\frac{n-1}{n}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

12. $f(n+1) = \begin{cases} \frac{1}{n-1}, & n \equiv 0 \pmod 2 \\ \frac{1}{n+1}, & n \equiv 1 \pmod 2 \end{cases}$

$\Rightarrow$ **f(3) + f(4) = ?**

A) $\frac{7}{4}$ B) $\frac{5}{2}$ C) $\frac{5}{4}$ D) $\frac{4}{5}$ E) $\frac{2}{5}$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2016]

13. $\binom{n}{r} = \frac{n!}{(n-r)!\cdot r!}$

$$\Rightarrow \binom{11}{1} + \binom{11}{2} + \binom{11}{3} + ... + \binom{11}{10} = ?$$

A) 256 B) 2^{10} C) 768 D) $2^{12} - 10$ E) $2^{11} - 2$

[YILDIZ TEKNİK ÜNİVERSİTESİ – YÖS 2015]

14. $\frac{(n+1)! + n!}{(n-1)!} = 35 \Rightarrow$ **n = ?**

A) 3 B) 5 C) 7 D) 9 E) 11

[ONDOKUZ MAYIS ÜNİVERSİTESİ – YÖS 2014]

15. $a = 2013$

$b = 2015$

$\Rightarrow$ $a^5 - 5\cdot a^4\cdot b + 10\cdot a^3\cdot b^2 - 10\cdot a^2\cdot b^3 + 5\cdot a\cdot b^4 - b^5 = ?$

A) –32 B) –21 C) 0 D) 16 E) 20

[MARMARA ÜNİVERSİTESİ – YÖS 2013]

16. $C(n,r) = \frac{n!}{r!\cdot(n-r)!}$

$C(5,3) = C(k,2) \Rightarrow$ **k = ?**

A) 7 B) 6 C) 5 D) 4 E) 3

[YÖS-2000]

YANITLAR / ANSWERS

1	2	3	4	5	6	7	8
C	D	C	B	B	C	D	A
9	10	11	12	13	14	15	16
C	D	B	C	E	B	A	C

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